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THE

UNIVERSITY OF MINNESOTA

BULLETIN

The College of Agriculture

UNIVERSITY OF ILLINOIS
PRESIDENT'S OFFICE.

1907-08

Volume X August 20, 1907 No. 8.

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THE REGISTRAR,
The University of Minnesota,
Minneapolis, Minnesota.

UNIVERSITY OF ILLINOIS

CALENDAR FOR 1907-1908

PRESIDENT'S OFFICE

1907

JULY

S.	M.	T.	W.	T.	F.	S.
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SEPTEMBER

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OCTOBER

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DECEMBER

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1908

JANUARY

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MARCH

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APRIL

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MAY

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JUNE

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University Calendar, 1907-1908

THE UNIVERSITY YEAR

The University year covers a period of thirty-eight weeks beginning on the second Tuesday in September. Commencement day is always the second Thursday in June.

Classes will meet for the first time Tuesday, September 17th. Monday, Wednesday, and Friday classes will meet during the first half of the regular periods of recitation, and the Tuesday, Thursday, and Saturday classes will meet during the second half of the period. Announcements and assignments of work will be made by instructors at the time specified.

FIRST SEMESTER

SEPTEMBER	9	M	Entrance examinations and registration	
	10	T	Entrance examinations and registration	
	11	W	Entrance examinations and registration	
	12	Th	Entrance examinations and registration	
	13	F	Entrance examinations and registration	
	14	S	Examinations end and registration completed	1 w
	17	T	Classes called for regular work (First College classes organized, 1869)	
	21	S		2 w
	28	S		3 w
OCTOBER	5	S		4 w
	12	S		5 w
	18	F	Governor John S. Pillsbury died, 1901	
	19	S		6 w
	26	S		7 w
NOVEMBER	2	S		8 w
	9	S		9 w
	16	S		10 w
	23	S		11 w
	28	T	Thanksgiving Day. Recess three days	
	30	S		12 w
DECEMBER	7	S		13 w
	14	S		14 w
	21	S	Holiday recess begins (no classes)	15 w
	25	W	Christmas Day	
JANUARY	1	W	New Year's Day	
	7	T	Work resumed in all departments	
	11	S		16 w
	18	S		17 w
	25	S	Semester examinations VII and VIII hour classes	18 w
	27	M	Semester examinations I hour classes	
	28	T	Semester examinations II hour classes	
	29	W	Semester examinations III hour classes	
	30	Th	Semester examinations IV hour classes	
	31	F	Semester examinations V hour classes	
FEBRUARY	1	S	Semester examinations VI hour classes	
	4	T	Second semester begins—Classes called for regular work	
	8	S		1 w
	12	W	Lincoln's birthday—Holiday	

	15	S		2 w
	18	T	University Charter, 1868	
	22	S	Washington's birthday—Holiday	3 w
	29	S		4 w
MARCH	7	S		5 w
	14	S		6 w
	21	S		7 w
	28	S		8 w
APRIL	4	S		9 w
	11	S		10 w
	18	S		11 w
	25	S		12 w
MAY	2	S		13 w
	9	S		14 w
	16	S		15 w
	23	S		16 w
	30	S	Semester examinations VII and VIII hour classes	17 w
JUNE	1	M	Semester examinations I hour classes	
	2	T	Semester examinations II hour classes	
	3	W	Semester examinations III hour classes	
	4	Th	Semester examinations IV hour classes	
	5	F	Semester examinations V hour classes	
	6	S	Semester examinations VI hour classes	18 w

COMMENCEMENT WEEK, 1908

SUNDAY	June 7	Baccalaureate Service
MONDAY	June 8	Senior Class Exercises
TUESDAY	June 9	Phi Beta Kappa Address. Senior Promenade
WEDNESDAY	June 10	Alumni Day
THURSDAY	June 11	Commencement Day—The Thirty-sixth Annual Commencement
FRIDAY	June 12	Summer Vacation Begins

PROGRAM OF ENTRANCE EXAMINATIONS

MONDAY,	September 9,	9 A. M.	3	Botany
			3	Zoology
			1	Astronomy
			3	Geology
		2 P. M.	2	American Government
			2	Political Economy
TUESDAY,	September 10,	9 A. M.	2	History
			5	Physics
		2 P. M.	4	Chemistry
			3	Physiography
WEDNESDAY,	September 11,	9 A. M.	1	English
		2 P. M.	1	German
			1	French
			1	Latin
			1	Scandinavian
THURSDAY,	September 12,	9 A. M.	6	Elementary Algebra
			3	Commercial Geography
		2 P. M.	6	Higher Algebra
FRIDAY,	September 13,	9 A. M.	6	Plane Geometry
		2 P. M.	6	Solid Geometry

1 Folwell Hall, 2 Library Building, 3 Pillsbury Hall, 4 Chemical Laboratory, 5 Physics Building, 6 Mechanic Arts Building

PROGRAM OF CONDITION EXAMINATIONS

TUESDAY,	September 10,	9 A. M.	English, Rhetoric
		2 P. M.	Mathematics, Philosophy, Psychology
WEDNESDAY,	September 11,	9 A. M.	Animal Biology, Botany, Geology, Physics
		2 P. M.	Astronomy, Chemistry, Economics, Drawing
THURSDAY,	September 12,	9 A. M.	French, German, Greek, Scandinavian
		2 P. M.	History, Latin, Education, Politics

For notice of the class-rooms in which these examinations will be given, see bulletin in library building.

The University

The University of Minnesota comprises the following named schools, colleges, and departments:

- THE GRADUATE SCHOOL
- THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS
- THE COLLEGE OF ENGINEERING AND THE MECHANIC ARTS
- THE SCHOOL OF MINES
- THE SCHOOL OF ANALYTICAL AND APPLIED CHEMISTRY
- THE COLLEGE OF EDUCATION
- THE UNIVERSITY SUMMER SCHOOL
- THE DEPARTMENT OF AGRICULTURE, including—
  - The College of Agriculture
  - The School of Agriculture
  - Short Course for Farmers
  - The Dairy School
  - The Crookston School of Agriculture
- THE COLLEGE OF LAW
- THE COLLEGE OF MEDICINE AND SURGERY
- THE COLLEGE OF HOMEOPATHIC MEDICINE AND SURGERY
- THE COLLEGE OF DENTISTRY
- THE COLLEGE OF PHARMACY

The Regents of the University have also entrusted to their charge:

- The Experiment Stations, including:
  - The Main Station at St. Anthony Park
  - The Sub-Station at Crookston
  - The Sub-Station at Grand Rapids
- THE GEOLOGICAL AND NATURAL HISTORY SURVEY

Bulletins of these schools, colleges and departments may be obtained upon application to the University Registrar.

In the COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS, there is a four-year course of study leading to the degree, Bachelor of Arts. The work of the first year is elective within certain limitations as to the range of subjects from which the electives may be chosen. The remaining work of the course is entirely elective, with the provision that a certain number of long courses be selected. The course is so elastic that it permits the student to make the general scope of his course classic, scientific or literary, to suit his individual purpose.

THE COLLEGE OF ENGINEERING AND THE MECHANIC ARTS offers courses of study, of four years each, in civil, mechanical, electrical and municipal engineering, leading to the degrees of Civil, Mechanical, and Electrical Engineer. This college offers a four-year course of study in science and technology, leading to the degree of Bachelor of Science, with an additional year leading to the engineer's degree in any one of the various lines offered in the college. This college also offers graduate work leading to the degree, Master of Science.

THE SCHOOL OF MINES offers four-year courses of study in mining and metallurgy upon completion of which the degrees, Engineer of Mines and Metallurgical Engineer, are conferred.

THE SCHOOL OF ANALYTICAL AND APPLIED CHEMISTRY, leading to the degrees, Bachelor of Science in Chemistry, and Bachelor of Science in Chemical Engineering, offers two courses of study of four years each in analytical and applied chemistry.

THE COLLEGE OF EDUCATION receives students who have completed two years of college work, and offers them a three-year course leading to the master's degree. At the end of the second year students may receive the bachelor's degree and the University teacher's certificate. Graduates of other colleges, who have pursued an equivalent course in education, may enter for the master's degree.

THE GRADUATE SCHOOL gathers into a single organization and unites for the purposes of administration all the activities of the University in all its schools and colleges in so far as they relate to advanced instruction offered for the second or higher degrees, viz.; Master of Arts and Doctor of Philosophy conferred for advanced, non-technical study; Master of Science and Doctor of Science for technical study; Master of Laws and Doctor of Civil Law for advanced legal studies. The privileges of this school are in general open to all Bachelors of Arts, of Science, pure and applied, and of Laws, from reputable colleges and universities having courses substantially equivalent to those at this University.

THE UNIVERSITY SUMMER SCHOOL is organized for a six weeks' session in June and July under the direction of the State Department of Public Instruction. In the elementary section courses are given for teachers in all the common school branches and in preparation for the state teacher's certificates. In the college section courses are given for high school teachers and in preparation for the state professional certificate. Students who desire University entrance credits and credits toward the bachelor's degree may secure these by pursuing not more than two full courses at each session.

SPECIAL COURSES. In each of the Colleges, students of mature age and adequate preparation are permitted to pursue, under the direction of the faculty, one or two distinct lines of study.

EXTENSION LECTURES. Professors in the University are prepared to give a limited number of extension lectures from time to time. For subjects, speakers, terms and dates, application should be made to the Chairman of the Committee on University Extension.

THE COLLEGE OF AGRICULTURE offers a four-year course in agriculture. The degree of Bachelor of Science, in Agriculture, is conferred upon completion of the course. Students in this College may specialize along the line of forestry or of home economics and secure the degree, Bachelor of Science (in Forestry, or in Home Economics).

THE SCHOOL OF AGRICULTURE offers a three-year course of study and is a training school for practical farm life and in domestic economy. The College of Agriculture is open to graduates of this School who have completed the fourth year of work required for admission to the college.

The Dairy School offers practical instruction in dairying, specially designed for those who are actually engaged in the manufacture of butter and cheese.

The Short Course for Farmers is designed to be of the greatest help possible to those actually engaged in farming.

The Crookston State School of Agriculture offers a course of study quite similar to that given in the School of Agriculture.

THE COLLEGE OF LAW offers a three-year course of instruction leading to the degree of Bachelor of Laws. Graduate work leading to the degrees, Master of Laws, and Doctor of Civil Law, is offered. An evening class is provided in this college.

THE COLLEGE OF MEDICINE AND SURGERY, AND THE COLLEGE OF HOMEOPATHIC MEDICINE AND SURGERY offer four-year courses of study, of nine months each. Upon completion of either of the prescribed courses the degree, Doctor of Medicine, is conferred.

In the Colleges of Science, Literature and the Arts, of Medicine and Surgery, and of Homeopathic Medicine and Surgery, there has been established a combined course of six years, leading to the degrees, Bachelor of Science, and Doctor of Medicine.

THE COLLEGE OF DENTISTRY offers a three-year course of study, of nine months each. Upon completion of the prescribed course the degree of Doctor of Dental Surgery is conferred.

THE COLLEGE OF PHARMACY offers a two or three-year course of study leading to the degree of Pharmaceutical Chemist. This college also offers graduate work leading to the degrees, Master of Pharmacy and Doctor of Pharmacy.

Historical

AN ACT to re-organize and provide for the government and regulation of the University of Minnesota, and to establish an Agricultural College therein.

As amended by Chapter X of the General Laws of 1872:

AN ACT to amend Chapter I of the Session Laws of 1868, relating to the University of Minnesota.

Section 1. The object of the University of Minnesota, established by the Constitution at or near the Falls of St. Anthony, shall be to provide the means of acquiring a thorough knowledge of the various branches of literature, science and the arts, and such branches of learning as are related to agriculture and the mechanic arts, including military tactics and other scientific and classical studies.

Sec. 2. There shall be established in the University of Minnesota five or more colleges or departments, that is to say, a College of Science, Literature, and the Arts, a College of Agriculture, including "military tactics," a College of Mechanic Arts, a College or Department of Law, and also a College or Department of Medicine. The Department of Elementary Instruction may be dispensed with at such a rate and in such wise as may seem just and proper to the Board of Regents.

Sec. 3. The government of the University shall be vested in a board of ten Regents of which the Governor of the State, the State Superintendent of Public Instruction, and the President of the University, shall be members ex-officio and the remaining seven members thereof shall be appointed by the Governor, by and with the advice and consent of the Senate. Whenever a vacancy occurs therein, for any cause, the same shall be filled for the unexpired term in the same manner. Of the Regents thus appointed, two shall be commissioned and hold their offices for one year, and two for two years, and three for three years. Their successors shall be appointed in a like manner, and shall hold their offices for the full term of three years from the first Wednesday of March succeeding their appointment and until their successors are appointed and qualified. The President of the University shall have the same rights, powers and privileges as other members, *except the right of voting, and shall be, ex-officio, the Corresponding Secretary of the Board of Regents.

Sec. 4. The Regents of the University shall constitute a body corporate, under the name and style of "The University of Minnesota," and by that name may sue and be sued, contract and be contracted with, make and use a common seal and alter the same at pleasure; a majority of the voting members shall constitute a quorum for the transaction of business, and a less number may adjourn from time to time.

Sec. 5. The Board of Regents shall elect from the members of the

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* By the later act the President has been given a vote.

Board, a President of the Board; (a) Recording Secretary and (a) Treasurer, who shall hold their respective offices during the pleasure of the Board. And the President and Treasurer each before entering upon the duties of his office, shall execute a bond, in the penal sum of fifty thousand dollars, with at least two sufficient sureties, to the State of Minnesota, to be approved by the Governor, conditioned for the faithful and honest performance of the duties of his office according to law, which bonds, when so approved, shall be filed at the office of the Secretary of State.

Sec. 6. The Board of Regents shall have the power, and it shall be their duty, to enact by-laws for the government of the University of Minnesota in all its departments; to elect a President of the University, and in their discretion a Vice-President, and the requisite number of professors, instructors, officers and employes, and to fix their salaries, (and) also the term of office of each, and to determine the moral and educational qualifications of applicants for admission, and in the appointment of professors, instructors and other officers, and assistants of the University, and in prescribing the studies and exercise thereof; and in all the management and government thereof, no partiality or preference shall be shown to one sect or religious denomination over another; nor shall anything sectarian be taught therein. And the Board of Regents shall have the power to regulate the course of instruction, and (to) prescribe the books and authorities to be used, and also to confer such degrees and grant such diplomas as is usual, in their discretion. It shall be the duty of the Recording Secretary to record all the proceedings of the Board, and carefully preserve all its books and papers; and before entering upon the duties of his office he shall take and subscribe an oath to perform his duties honestly and faithfully as such officer. It shall be the duty of the Treasurer to keep an exact and faithful account of all moneys, bills receivable and evidence of indebtedness, and all securities of property received or paid out by him, and before entering upon his duties shall take and subscribe an oath that he will well and faithfully perform the duties of Treasurer thereof. It shall be the duty of the President to preside at the meetings of the Board; and, in case of his inability to preside, the Board may appoint a President pro tempore.

Sec. 7. In addition to all the rights, immunities, franchises and endowments heretofore granted or conferred upon the University of Minnesota, for the endowment, support and maintenance thereof, there shall be and is hereby inviolably appropriated, and placed at the disposal of the Board of Regents thereof, to be drawn from the State treasury upon the order of the President, drawn upon the State Auditor, countersigned by the Secretary of the Board, and payable to the order of the Treasurer of the Board, all the interest and income of the fund to be derived from the sale of all lands granted and to be granted to the State of Minnesota by virtue of an act of Congress, entitled "An act donating lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts," approved July 2d, 1867, and also all such gifts, grants and contributions to the endowment thereof as may be derived from any and all such sources.

Sec. 8. And in order to effect a settlement of all remaining indebtedness of the University, all the powers and authorities given by Chapter 18 of the laws of 1864, entitled "An act relating to the University of Minnesota." and Chapter 11 of the laws of 1866, entitled "An act to amend an act relating to the University of Minnesota, approved March 4, 1864," to the Regents therein mentioned, are hereby given to and conferred upon the Board of Regents of the University of Minnesota aforesaid, and the said acts are hereby continued and shall be in force until such outstanding indebtedness is fully liquidated.

Sec. 9. The first meeting of the first Board of Regents under the provisions of this act, shall be holden at the University building on the first Wednesday in March, 1868, at which meeting the officers of the Board shall be elected, and the annual meetings of the Board shall be holden on the second Tuesday in December in each and every year thereafter.

Sec. 10. Any person or persons contributing a sum of not less than fifteen thousand dollars shall have the privilege of endowing a professorship in the University, the name and object of which shall be designated by the Board of Regents.

Sec. 11. The said Board of Regents shall succeed to and have control of the books, records, buildings and all other property of the University; and the present Board of Regents shall be dissolved immediately upon the organization of the Board herein provided for. Provided, that all contracts made at that time, binding upon the Board then dissolved, shall be assumed and discharged by their successors in office.

Sec. 12. It shall be the duty of the Board of Regents herein provided for, to make arrangements for securing suitable lands, pursuant to the act of Congress, above mentioned, in the vicinity of the University, for an experimental farm, and as soon thereafter as may be to make such improvements thereon as will render the same available for experimental purposes in connection with the course in the agricultural college; and for such purposes, the Board of Regents is hereby authorized to expend a sum not exceeding the amount specified by the act of Congress aforesaid.

Sec. 13. On or before the second Tuesday in December in each and every year, the Board of Regents, through their President, shall make a report to the Governor, showing in detail the progress and condition of the University during the previous University year, the wants of the institution in all its various departments—the nature, costs and results of all improvements, experiments and investigations, the number of professors and students—the amount of money received and disbursed—and such other matters, including industrial and economic statistics, as they deem important or useful. One copy of said report shall be transmitted to each of the other colleges endowed under the provisions of the said act of Congress, and one copy to the Secretary of the Interior.

Sec. 14. The President of the University shall be the President of the General Faculty, and of the special faculties of the several departments or colleges, and the executive head of the institution in all its departments. As such officer, he shall have authority, subject to the Board of Regents, to give general direction to the practical affairs and scientific investigations of the University, and in the recess of the Board of Regents to remove any employe or subordinate officer not a member of the Faculty and supply for the time being any vacancies thus created. He shall perform the customary duties of a corresponding secretary, and may be charged with the duties of one of the professorships. He shall make to the Superintendent of Public Instruction, on or before the second Tuesday in December in each and every year, a report showing in detail the progress and condition of the University during the previous University year—the number of professors and students in the several departments—and such other matters relating to the proper educational work of the institution as he shall deem useful. It shall be the duty of the President of the University to make to the Board of Regents, on or before the second Tuesday in December in each and every year, a report showing in detail the progress and condition of the University during the previous University year—the nature and results of all important experiments and investigations and such other matters, including economic and industrial facts and statistics, as he shall deem useful.

Sec. 15. Chapter eighty of the laws of eighteen hundred and sixty, chapter eighty-seven of the laws of eighteen hundred and sixty-two, and so much and such parts of any and all acts and laws, whether general or special, as are inconsistent with the provisions of this act, are hereby repealed.

Sec. 16. This act shall take effect and be in force from and after its passage.

Approved February 18, 1868. Act to amend approved February 29, 1872.

The Board of Regents

CYRUS NORTHROP, LL.D., Minneapolis The President of the University.	*Ex-Officio*
The HON. JAMES T. WYMAN, Minneapolis The President of the Board.	1908
The HON. JOHN A. JOHNSON, St. Peter The Governor of the State.	*Ex-Officio*
The HON. JOHN W. OLSEN, Albert Lea The State Superintendent of Public Instruction.	*Ex-Officio*
The Hon. S. G. COMSTOCK, Moorhead	1908
The HON. THOMAS WILSON, St. Paul	1909
The HON. B. F. NELSON, Minneapolis	1909
The HON. A. E. RICE, Willmar	1909
The HON. PIERCE BUTLER, St. Paul	1910
The HON. DANIEL R. NOYES, St. Paul	1910
The HON. S. M. OWEN, Minneapolis	1913
The HON. W. J. MAYO, Rochester	1913

C. D. DECKER, Austin,
Secretary of the Board.

Executive Officers

THE UNIVERSITY

Cyrus Northrop, LL. D., *President*
Ernest B. Pierce, B. A., *Registrar*
James T. Gerould, B. A., *Librarian*
C. D. Decker, *Purchasing Agent*

THE COLLEGES

John F. Downey, M.A., C.E., *Dean of the College of Science, Literature, and the Arts*

Frederick S. Jones, M.A., *Dean of the College of Engineering and the Mechanic Arts*

Eugene W. Randall, *Dean and Director of the Department of Agriculture.*

William S. Pattee, LL. D., *Dean of the College of Law*

Frank Fairchild Wesbrook, M.A., M.D., C.M., *Dean of the College of Medicine and Surgery*
Eugene L. Mann, B.A., M.D., *Dean of the College of Homeopathic Medicine and Surgery*
Alfred Owre, D.M.D., M.D., *Dean of the College of Dentistry*
Frederick J. Wulling, Phm.D., LL.M., *Dean of the College of Pharmacy*
William R. Appleby, M.A., *Dean of the School of Mines*
George B. Frankforter, Ph.D., *Dean of the School of Chemistry*
George F. James, Ph.D., *Dean of the School of Education*
Henry T. Eddy, C.E., Ph.D., LL.D., *Dean of the Graduate School*
Ada L. Comstock, M.A., *Dean of Women.*

The University Council

At the regular meeting of the Board of Regents of the University, May 31st, 1905, a University Council was established according to the following plan:

I. The name of the body shall be The University Council. It shall consist of the President of the University, the Deans of the various colleges and schools, one elected representative from each college or school for each 400 students or major fraction thereof, and one representative of the general alumni association.

II. The elected members shall serve for a period of one year. They shall be chosen from the various faculties at the time of the selection of standing committees. The representative of the general alumni association shall be chosen by that body at its annual meeting from among the alumni who are not members of the University.

III. The Council shall be authorized to—

a) Appoint the following committees or the faculty representation thereon:

The University auditing committee
The University press committee
The committee on athletics
The committee on University relations to other institutions of higher learning
The committee on health and sanitation
The committee on commencement and other University functions
The committee on catalogue, programs and courses of study
The committee on student entertainments and social affairs
And such other committees as the general University interests may require

b) Receive reports from such committees and to make such recommendations as may be required.

c) Consider and act upon any matter of general University interest beyond the province of a single faculty which may be referred to it by the President of the University or any faculty.

IV. The Council shall hold stated meetings upon the first Monday of October, December, April and June, and such other meetings as the President of the University may call.

Representatives to the Council

The College of Science, Literature and the Arts

Dean John F. Downey
Professor William Watts Folwell
Professor J. C. Hutchinson
Professor H. F. Nachtrieb
Professor Norman Wilde

The College of Engineering and the Mechanic Arts
Dean Frederick S. Jones
Professor George D. Shepardson

The School of Mines
Dean William R. Appleby

The School of Chemistry
Dean George B. Frankforter

The College of Education
Dean George F. James

The Graduate School
Dean Henry T. Eddy

The College and the School of Agriculture
Dean Eugene W. Randall
Professor Harry Snyder
Professor Samuel B. Green.

The College of Law
Dean William S. Pattee
Judge A. C. Hickman

The College of Medicine and Surgery
Dean F. F. Wesbrook
Professor Thomas G. Lee

The College of Homeopathic Medicine and Surgery
Dean Eugene L. Mann

The College of Dentistry
Dean Alfred Owre

The College of Pharmacy
Dean Frederick John Wulling

General Alumni Association
David P. Jones

University Council Committees

The University Auditing Committee
Professors Anderson, Sigerfoos, Springer, Fletcher, Owre

The Committee on Athletics
Professors Paige, Brooke, Harding, McVey, Dr. Litzenberg

The Committee on Grounds and Sanitation
Professors Reynolds, Flather, Sidener

The Committee on Catalogue, Programs and Courses of Study
Professors Frankforter, McVey, Pattee, Jones, Snyder, Appleby, Lee

The Press Committee
Professors Schaper, Erdmann, Constant, Snyder, James

The Committee on Commencement and other University Functions
Professors Nachtrieb, Pattee, Eddy, Lee, Owre, Washburn, Schlenker

The Committee on Student Entertainments and Social Affairs
Professors Frankforter, Pike, S. M. White, Bass, Willis

The Committee on University Relations to other Institutions of Higher Learning
Professors Downey, Folwell, Green, Lee

The Committee on University Extension and University Lectures
Professors James, Schlenker, Mann, Haecker, McVey

The Committee on the Library
Professors Eddy, Downey, West, Lee, F. S. Jones, Fletcher and Mr. D. P. Jones.

General Information

STUDENT ORGANIZATIONS

The Students' Christian Association was organized in 1869, its object being to promote growth in Christian character, and to engage in such religious work as may be deemed expedient and necessary. The Association owns a commodious building, which serves as the headquarters for student religious activity. All persons in sympathy with the object of the Association are eligible to membership.

The Young Men's Christian Association has as its object the promotion of "growth in grace and Christian fellowship among its members and aggressive Christian work, by and for students." This association leases the Students' Christian Association building and keeps it constantly open, with a General Secretary in charge. All men in sympathy with the object of the association are eligible to membership. This building is maintained as the social and religious headquarters of all young men in the University.

This Association also provides an employment bureau whose services are free to students in all departments of the institution, as well as a committee to help students to find comfortable rooms and boarding places. The Association also maintains an educational department in which students may make up their entrance conditions at a nominal charge for instruction. The General Secretary will be pleased to correspond with any young man intending to come to the University. Any inquiry about board, room, employment, or general information will gladly be answered, and a hand-book will be sent to any one wishing it. Address the General Secretary of the Young Men's Christian Association, University of Minnesota, Minneapolis, Minnesota.

The Young Women's Christian Association is the center of Christian life among the young women of the University. Its object is "to deepen spiritual thought in the University woman, to environ her with a semblance of home, to bring to her friendship, assistance and sociability by stimulating student fellowship, to give her personal help when necessary; thus developing in her the Christ ideal of culture in womanhood."

To this end frequent socials and informal teas are given throughout the year; twice each week twenty-minute prayer meetings are held; a dozen circles meet one hour a week for devotional Bible study; and from time to time missionary meetings are held. The General Secretary devotes all of her time to the Association and will be pleased to correspond with any young woman who wishes information regarding the University.

All young women are invited to visit the Young Women's Christian Association room before registering. Women from the upper classes will be there during the opening days to give advice and assistance. Any inquiry about board, room, employment, or general information will gladly be answered by Miss Margaret Elwell, 945 14th Ave., S. E., Minneapolis.

The University Catholic Association was organized by the Catholic students in the spring of 1900. The purpose of the Association is the study of the Bible and of the doctrines and history of the Catholic Church. Membership is open to any one connected with the University. Regular meetings are held every Sunday afternoon in the rooms of either the Young Men's or the Young Women's Christian Association, through the courtesy of those organizations. The Association is planning to erect a building on or near the campus at an early date.

Aside from the religious objects, the Association tends to promote good fellowship among its members. Early in each University year a reception is tendered to new students and during the year two or more socials are held. Further information may be obtained by addressing the Secretary of the Association at the University.

The Woman's League is an organization of the women of the University for mutual helpfulness and sociability.

LITERARY, SCIENTIFIC, AND MUSICAL ORGANIZATIONS

Phi Beta Kappa.—A chapter of the honorary society of *Phi Beta Kappa* was established at the University in 1892. A small proportion of the graduates of the College of Science, Literature, and the Arts are elected to membership each year. Election is based upon high scholarship and character.

Sigma Xi.—A chapter of the honorary scientific society of *Sigma Xi* was established at the University in 1896. A small proportion of the graduates of the scientific, and technical department are elected to membership each year. Election is based upon high scholarship and character.

The Graduate Club is a club organized for the purpose of fostering a greater interest in graduate work, for mutual help, and for the discussion of topics under investigation.

The Minnesota Literary Union is a federation of the members of the following societies: Shakopean, Forum, Castalian, Minerva, and Arena. Four meetings are held each year.

Literary Societies.—The above named literary societies are mainly debating clubs. Every student is welcome to attend the literary sessions, but the business sessions are usually held behind closed doors. Students desiring to join should make early application to some member of the society he prefers, as the membership is limited.

Membership Limit: *Shakopean,* 35, men; *Forum,* 30, men; *Minerva,* 30, women; *Law Literary,* unlimited, law students; *Castalian,* 35, men; *Theta Epsilon,* 30, women; *Thalian,* 25, women; *Acanthus,* 30, women.

The Debating Board has charge of home and inter-collegiate oratorical contests.

The Northern Oratorical League is composed of the oratorical associations of the University of Michigan, Northwestern University, the University of Wisconsin, Oberlin College, the State University of Iowa, the University of Chicago, and the University of Minnesota. Its purpose is to foster an interest in public speaking and to elevate the standard of oratory by holding annual contests. The contests are open only to undergraduates.

The Iowa-Minnesota League is composed of the two universities and holds an annual contest in debate.

The Central Debating League is composed of the debating associations of the University of Michigan, the University of Minnesota, Northwestern University, and the University of Chicago. Its purpose is to discuss in public leading questions of the day and in this way to develop ready and forceful speakers.

The four universities are arranged in two groups for the semi-final debates, which are held the second Tuesday in January. On the first Friday in April in each year, the winners from the groups meet in a final debate in the city of Chicago.

The University competes annually for the *Hamilton Club* prize. Michigan, Minnesota, Wisconsin, Iowa, Ohio, Indiana, Northwestern and Chicago Universities and Knox College constitute the league. Each of the colleges named submits one oration upon Alexander Hamilton or some character or event connected with his time. From the orations submitted four are chosen to be delivered before the Hamilton Club.

The Dramatic Club is organized for the study and practice of dramatic art.

The Glee and Mandolin Clubs give a public concert each year at the University and make a tour of the state during the holidays.

The University Band is organized as a part of the military system of the University and is composed of about sixty musicians. It is under the efficient leadership of an instructor in Music, and furnishes music for military and many other University affairs.

The Philological Society.—The object of the Philological Society is to promote philological investigation and study.

Greek Club is a society composed of professors, students, and alumni of the Department of Greek for the study of Greek life, language, and customs.

The Scandinavian Literary Club is an organization whose purpose is to promote interest in the study of Scandinavian literatures.

The Philosophical Club meets bi-weekly in the evening during the winter months to read and discuss contemporary philosophy. The membership consists of the professors, instructors, and qualified students of the department.

The Economic Club meets twice a month for debate in economic and political subjects.

American Chemical Society.—A local section of the American Chemical Society has been organized in Minnesota with headquarters at the University.

The Camera Club is an organization of instructors and students interested in photography and photographic chemistry.

The Geological Club is an organization of instructors and students interested in geology, for the discussion of geological problems, and the prosecution of research.

The Botanical Students' Journal Club is an organization of juniors, seniors, and graduate students, of the Department of Botany, for the review of current botanical literature.

The Zoological Journal Club for instructors and advanced students who meet for the discussion of current zoological literature.

The Zoological Reading Club meets evenings at the homes of the professors and is for instructors and graduate students. Its purpose is the reading and discussion of philosophical works on Zoology.

The Physical Colloquium is composed of instructors and graduate students and meets for the discussion of recent investigations in physical science.

The Mathematical Society is composed of professors, assistant professors, and instructors whose work is in Pure or Applied Mathematics, and meets the third Wednesday of each month for the discussion of mathematical subjects.

PUBLICATIONS

The University Catalogues are published by authority of the Board of Regents, as a regular series of bulletins. The number issued each year varies from twelve to fourteen. Bulletins will be sent gratuitously, postage paid, to all persons who apply for them.

The Minnesota Alumni Weekly is published every Monday during the University year. The Weekly is published entirely in the interest of the alumni and is devoted to alumni news and such University news as may be of special interest to the alumni.

The Minnesota Daily is published five times each week during the University year by an organization of University students.

The Yearbook of the Society of Engineers is published annually by the engineering students.

The Junior Annual, called the "Gopher," is a book published annually by the junior class of the University.

The Minnesota Magazine is a monthly magazine devoted to the cultivation of literary taste and effort among the students of the University. It is managed by a board of editors chosen from the senior class.

THE ONE-MILE LIQUOR LAW

A state law provides that "it shall be unlawful for any person to sell or dispose of any spirituous, vinous, or malt liquors within the distance of one mile of the Main Building of the University of Minnesota, as now located in the city of Minneapolis; provided, that the provisions of this section shall not apply to that part of the city of Minneapolis lying on the west side of the Mississippi River."

MILITARY DRILL

The act of Congress of 1862, providing for the establishment of "Land Grant Colleges," requires that instruction be given in Military Science and Tactics at all institutions that are its beneficiaries. The Armory is located on the University campus and has all the facilities usually provided in a modern Armory. The United States Government supplies the University with the necessary arms, equipment and ammunition for instruction in infantry and artillery drill, and details a commissioned officer of the regular army to take charge of the department.

THE ATHLETIC ASSOCIATION

The Athletic Association is an organization having for its object the general physical well-being of the students and the encouragement of a proper spirit in favor of hearty, manly sports.

Control of Athletics. The athletic sports of the University are under the supervision of a Board of Control made up of eleven members; two are members of the faculty, two are alumni, and seven are students. This board has general supervision of all matters connected with athletic contests and arranges the schedule of games. It is the purpose of the board to foster a spirit in favor of fairness and honesty in all athletic contests.

Northrop Field is an enclosed athletic field containing about six acres, immediately adjoining the armory. It contains a modern cinder track, baseball diamond and football gridiron. The grand stands have a seating capacity of about 15,000. A large portion of this field was a gift to the University from the heirs of the late John S. Pillsbury, and the brick wall surrounding it is the gift of his son, Mr. A. F. Pillsbury. It is generally conceded to be one of the handsomest fields in the West.

Scholarships, Loans, and Prizes

UNIVERSITY SCHOLARSHIPS

It is the policy of the University to establish scholarships in the different departments, where extra help is needed for instruction, under regulations somewhat as follows:

1. The appointments are made by the Executive Committee of the Board of Regents, upon the recommendation of the department in which the appointment is desired, after approval by the General Faculty.

2. Receipts of scholarships may be either graduate or undergraduate students.

3. The scholarships are not intended as gifts or benefactions from the state to the recipients, but as provisions under which services may be rendered to the University.

4. It is understood that these services are of a nature which shall assist the holder of a scholarship to attain the mastery of some line of work in the department to which he is appointed.

ENDOWED SCHOLARSHIPS

THE MOSES MARSTON SCHOLARSHIP IN ENGLISH

Friends and pupils of the late Professor Marston, Ph. D., have given and pledged one thousand dollars as a memorial fund. The annual income of the fund is to be used to help some student in the English course. The award of the income is made on the basis of pecuniary need and of deserving scholarship.

THE ALBERT HOWARD SCHOLARSHIP FUND

Under the last will and testament of Mr. James T. Howard, of the town of St. Johnsbury, Vermont, $4,166.81 was left to the University to establish a scholarship to be known as the "Albert Howard Scholarship." This scholarship is assigned by the Executive Committee upon the recommendation of the General Faculty.

STUDENT LOAN FUNDS

THE ELLIOT SCHOLARSHIP LOAN FUND

To fulfill the wish of the late Dr. A. F. Elliot to aid young men who find their efforts to obtain a practical education embarrassed through lack of means, the income of $5,000, amounting to $250 per year, is placed in the hands of the Board of Regents to be used as a scholarship loan fund for assisting young men in the school of mines.

The conditions of granting the scholarship are: The financial needs of the applicant, his scholarship, moral character, enthusiasm shown in his work and promise of usefulness in his profession. When money is available it may be loaned to pay expenses of .worthy students during sickness. The loans are to be repaid, without interest, at the earliest convenience of the recipients.

THE GILFILLAN TRUST FUND

The Honorable John B. Gilfillan has given to the University the sum of fifty thousand dollars, yielding an annual income of two thousand dollars, to be used by the Board of Regents to assist worthy students, needing such aid, to secure an education. The Regents are empowered to give this aid in the way of loans or gifts, according to the circumstances of the case. As a rule the fund is used as a loan fund, and a small rate of interest is charged. The details of the regulations which have been adopted by the Regents for the administration of the fund may be learned by addressing the President of the University.

PRIZES

THE PILLSBURY PRIZE

Three prizes of $100, $50, and $25, offered by the heirs of the Hon. John S. Pillsbury, are awarded for the best work in the Department of Rhetoric, as evidenced finally by an oration in public.

THE '89 MEMORIAL PRIZE IN HISTORY

The class of 1889, at graduation, established a prize of $25 each year, to be known as the '89 Memorial Prize, and to be given for the best thesis in history by a member of the graduating class. The award is made by a Professor in History in some other institution.

THE DUNWOODY PRIZE

Mr. William H. Dunwoody, president of the St. Anthony and Dakota Elevator Company, has provided a cash prize of $75 for the members of the team winning the inter-sophomore debate, and another prize of $25 for the student in the sophomore class writing and delivering the best oration.

Faculty

THE FACULTY

Cyrus Northrop, LL. D., *President.*
E. W. Randall, *Dean.*
Samuel B. Green, B. S., *Professor of Horticulture and Forestry.*
Harry Snyder, B. S., *Professor of Agricultural Chemistry and Soils.*
T. L. Haecker, *Professor of Dairy Husbandry.*
M. H. Reynolds, M. D., V. M., *Professor of Veterinary Medicine and Surgery.*
Andrew Boss, *Professor of Agriculture and Animal Husbandry.*
Frederick L. Washburn, M. A., *Professor of Entomology.*
D. D. Mayne, *Principal of School of Agriculture, Agl. Pedagogics.*
Fannie C. Boutelle, *Preceptress, Domestic Economics.*
E. M. Freeman, M. S., *Professor of Vegetable Pathology and Botany.*
William Boss, *Professor of Farm Structures and Farm Mechanics.*
John A. Hummel, B. Agr., *Assistant Professor of Agricultural Chemistry.*
C. P. Bull, B. Agr., *Assistant Professor of Agriculture.*
D. A. Gaumnitz, M. Agr., *Assistant Professor of Animal Husbandry.*
C. C. Lipp, D. V. M., *Assistant Professor of Physiology and Veterinary Medicine.*
E. G. Cheyney, B. S., *Assistant Professor of Forestry.*
S. B. Detwiler, B. S., *Assistant Professor of Forestry.*

INSTRUCTORS

J. A. Vye, *Farm Accounts.*
J. M. Drew, *Blacksmithing, Poultry.*
Juniata Shepperd, M. A., *Domestic Science.*
Margaret Blair, *Domestic Art.*
A. L. Ewing, M. S., *Agricultural Physics.*
A. G. Ruggles, M. A., *Entomology.*
A. D. Wilson, B. Agr., *Agriculture.*
E. C. Parker, B. Agr., *Agriculture.*
Le Roy Cady, B. Agr., *Horticulture.*
A. E. Wilhoit, M. A., *Soils.*
W. H. Tomhave, B. Agr., *Animal By-Products.*
W. L. Beebe, D. V. M., *Bacteriology.*
W. H. Frazier, B. S., *Agricultural Chemistry.*

In the College of Agriculture, three regular courses of study are offered: A course in agriculture, a course in forestry, and course in home economics.

REQUIREMENTS FOR ADMISSION TO ALL COURSES IN THE COLLEGE OF AGRICULTURE

Graduates of the School of Agriculture, who have completed the studies prescribed in the intermediate course or fourth year, and graduates of approved high and normal schools, as approved by the committee on entrance requirements and course of study, are admitted to the freshmen class in the courses in the College of Agriculture; the former to Division "A," and the latter to Division "B."

Agricultural students taking courses in the College of Science, Literature and the Arts, or in other colleges of the University, are required to conform to rules published in the bulletins of the respective colleges.

Students from other colleges and universities: Graduates from other colleges and universities may be admitted upon presentation of certificates, and will receive credit from the several professors for all work satisfactorily completed of similar character and grade to that given in this course.

Special students: Graduates of the School of Agriculture may be admitted as special students and be allowed to pursue such studies in the course offered in the College of Agriculture as are approved by the faculty.

All students in the College of Agriculture must advise with the dean or the committee on college and graduate work concerning all electives. No student is allowed to enter any course until such course is properly entered upon the student's registration card by the registrar of the University, and no credit shall be given for subjects in which the student has not been previously registered.

REQUIREMENTS FOR GRADUATION AND DEGREES

After the completion of the prescribed course of study, including all of the required work and the requisite amount of elective work equivalent to 128 credit hours, together with such practical experience as may be required by the committee on college course, students in the course in agriculture will be recommended for graduation with the degree of Bachelor of Science in Agriculture and students in the course in home economics with the degree of Bachelor of Science in Home Economics.

Students in the course in Forestry after completing the prescribed course of study, equivalent to 158 credit hours, will be recommended for graduation with the degree of Bachelor of Science in Forestry.

The elective studies designed as academic are to be chosen from the printed semester programs of work offered in the colleges of Science, Literature and the Arts; Law; Medicine; and Engineering; no student to take more than two semesters in either of the three last named colleges. The elective studies designated as agricultural are to be chosen from the printed program of work offered in the College of Agriculture.

GRADUATE WORK

Special facilities are offered to graduate students from this and other agricultural colleges who wish to become familiar with methods employed in experiment station work, and to pursue their collegiate studies further. Courses for major and minor subjects may be arranged by consulting the professors in the different divisions. Students who enter for advanced degrees register with the committee on registration of the College of Agriculture and also within the Graduate School. They must take their major subjects in the College of Agriculture, but they may take one or both of their two minor subjects in the College of Science, Literature and the Arts or in the College of Engineering and Mechanics Arts. Graduate students registered in the Graduate School may take one or both of their minor subjects in the College of Agriculture.

I. The degree of Master of Science in Agriculture will be conferred on a bachelor of this or any other agricultural college of equal grade who, not sooner than one year after graduation, if a resident graduate student at this agricultural college, shall pass an examination in certain prescribed lines of study and present a satisfactory thesis in accordance with the requirements of the Graduate School.

II. All general regulations of the Graduate School governing candidates for the master's degree, method of selecting work, amount of work required, degree of proficiency expected, and the time and manner of conducting the examinations, apply to candidates for master's degrees in the College of Agriculture.

III. The degree of Doctor of Science will be conferred by the Graduate School for study in the College of Agriculture on bachelors of this or any other agricultural college of equal grade within not less than three years after graduation therefrom under conditions prescribed by the faculty of the graduate school.

FEES

All students in the college, who are residents of the state of Minnesota, are charged an incidental fee of ten dollars a semester. Non-residents are charged double the fee required of residents of the state, or twenty dollars a semester. No reduction is made for late entrance or for leaving before the end of the semester. In addition to this fee, students who take work in laboratories are charged a sum sufficient to cover the cost of material and breakage.

LIBRARY

The Library of the College of Agriculture contains between 10,000 and 11,000 carefully selected volumes and a large number of pamphlets, bulletins, and reports which are unbound.

Each department connected with the school and college aids in bringing together all valuable material, and students will find every inducement to pursue an extended reading course in connection with their class work. The library also contains a small but well selected number of the standard works in English and American literature, and is well provided with general reference books, general technical periodicals. The card catalog of author and subject aids greatly in the use of the books which are all classified by the Dewey Decimal Classification. Those in charge are always pleased to assist students and aim to make the library a center for all agricultural research study.

The library is located in the new Main building. The rooms are well lighted and attractive.

COURSE IN AGRICULTURE

The course in agriculture is designed to give the student a broad education in the sciences and arts relating to agriculture and to fit him for the work of the agricultural specialist. The physical and biological sciences are made prominent. The work in these subjects is begun in the first or second year and may be continued throughout the course. For the first two years, the lines of study are prescribed, the subjects being chosen with a view of giving a good foundation for the work which follows. For the last two years, the work is mostly elective and gives the student an opportunity to take work along certain lines for which he has a special aptitude and liking.

In the College of Agriculture a portion of the work is taken in the College of Science, Literature and the Arts. All academic electives and the prescribed work in drawing, geology, German, French, rhetoric, botany, zoology, psychology, English literature, economics, and education are taken in the College of Science, Literature and the Arts. The agricultural electives and the prescribed subjects not mentioned above are taken at University Farm.

The classes in the College of Agriculture begin with the opening of the regular University year (for which see calendar) except the Freshman class which begins Monday, Sept. 9, and closes Saturday, June 1.

AGRICULTURE

Equipment. The equipment for instruction in agriculture consists of the following: Special laboratories and class rooms with modern apparatus for all courses, collections of classes and varieties of all field and weed seeds; herbariums of weeds and grasses indigenous to the state; a germinating room which affords opportunity for a study of the vitality and strength of seed; charts and models of various details of crops together with bulletins on farm management, the cost of crop production, and other pertinent topics supplement the daily lectures; machinery used on University farm and generously loaned by the firms of the Twin Cities which afford valuable subjects for instruction work. The fields and plots of the Experiment grounds offer additional "laboratories" and studies for use in class work. The student's home and farm is at all times made the basis of his particular study.

The State Grain Inspection department, elevators, mills and adjoining farms of the Twin Cities and vicinity furnish a study for the merchandizing of grains and the planning of farms. An agricultural museum, now being equipped, will contain much material that will be instructive and historic, and serve to show the close relation of agriculture and the modern industries.

Standard references upon agriculture are provided for an exhaustive study of any branch of this subject and original research is a prominent factor of the agricultural course.

AGRICULTURAL CHEMISTRY AND SOILS

Equipment. A special laboratory with modern apparatus for the analysis of soils, foods and agricultural products is provided. The equipment contains an experiment mill for the production of wheat flour, a Berthelot-Atwater calorimeter for the determination of the caloric value of foods, vacuum ovens, apparatus for the chemical and physical analysis of soils, an electrical apparatus for determining the resistance of soils to soluble salts, and the necessary facilities for human and animal food investigations. Special facilities are offered in soil investigations and in the analysis and testing of wheat, flour and cereal products for commercial purposes. Nutrition investigations, including the digestibility of foods, the chemical changes which take place in cooking, and the losses in the preparation of foods form a part of the Experiment Station work. This offers an opportunity for students to study methods of investigation relating to human food problems. Laboratory practice is also offered to advanced students in the study of household problems in which chemistry is involved. Special classes are also formed for the study of dietary problems. Standard reference books and journals, including Jahresbericht der Agrikultur Chemie, Coptes Rendus, Biedermann's Centralbatt, Annals de la Science Agronomique and Versuchs-Stationen are provided for the advanced work in agricultural chemistry.

Fees. In all of the laboratory courses in agricultural chemistry, a fee is charged to cover the cost of material used, and breakage. The student is assigned a certain amount of apparatus and material for which he gives a receipt, and deposits $3 with the accountant before beginning work. All apparatus returned in good condition at the close of the term is credited to the student's account upon settlement.

ANIMAL HUSBANDRY

Equipment. Representatives of some of the leading breeds of cattle, sheep and swine are kept at University farm, and herds of blooded stock near the institution, and the annual show of live stock at the state fair serve for extended observation of breeds and methods of management. Each year a number of experiments are under way in the feeding of these classes of animals. Breeding experiments are also undertaken with sheep and swine, and theoretical experiments with the smaller animals. Experiments in summer feeding cattle, sheep and swine wholly or in part on pasture are carried on each year. The new live stock building affords excellent accommodations for class work in stock judging.

DAIRY HUSBANDRY

Equipment. Students in the college course have the advantages of the equipment of the dairy school. The feeding and breeding experiments in the dairy division of the experiment station serve a most useful purpose in the collegiate instruction. The cordial relations existing between the department of agriculture and the other state institutions are often advantageous to college students well advanced in dairy work.

Representatives of several breeds of cattle are kept for class use. Herds in the vicinity and those shown at the state fair are useful to students in this course.

ENTOMOLOGY

Equipment. Well lighted laboratories with modern equipment are at the disposal of college students for both undergraduate and graduate work. Instruction is further aided by an excellent series of charts and lantern slides. The department is well equipped with museum specimens convenient to the lecture room, showing not only a large series of insects injurious and otherwise, but also many birds and other animals which have a direct bearing upon agriculture.

In economic work the student is brought into direct contact with spraying apparatus and insecticides. Practical work in bee keeping is offered in our apiary, and experiments in insect life can be carried on by advanced students in the insectary at nearly all seasons of the year.

FARM STRUCTURES AND FARM MECHANICS

Lectures and practicums in designing and construction of farm houses, farm barns, silos, out-buildings and conveniences; cement floors, walls, troughs; farm water systems, wells, cisterns, tanks house heating and plumbing systems, and in painting farm buildings.

Equipment. Students taking this subject have the advantage of many practical examples in designing and constructing farm buildings.

The buildings on the campus, such as farm house, barns, dairy buildings, greenhouses, live stock pavilion, sheep barns, swine barns, silos, the water, sewer and heating systems are available for this work.

Many new residence buildings being erected in the vicinity of the campus afford excellent opportunities for special studies in modern house construction.

The aim is to fit the student to be able to design, estimate the cost of and construct such buildings as are best adapted to meet farm conditions.

HORTICULTURE

Equipment. The work of the experiment station in Horticulture is carried on on a tract of land consisting of about twenty acres, devoted to orchard and ornamental planting. The legislature of 1907 provided $16,000 for the purchase of a fruit breeding farm which will probably be bought at an early date.

The campus of the School of Agriculture is planted out with a collection of trees, shrubs and herbaceous plants suitable for this section, the specimens of which are labeled with their common and botanical names. The parks, greenhouses, orchards and nurseries of the near vicinity afford convenient and satisfactory illustrations of the best commercial methods and ornamental planting. Our facilities in this line are unexcelled perhaps by any other college in this country.

The greenhouses, laboratories and class rooms of the Division of Horticulture are well equipped with modern apparatus. The Division library contains a large number of horticultural works and is further supplemented by a card index to all its literature.

VETERINARY MEDICINE AND SURGERY

Equipment. The veterinary building gives ample facilities for laboratory and clinical work. The hospital furnishes a variety of cases for study and demonstration and the dissecting room affords material and opportunity for studying the digestive organs and locomotor apparatus. A large and well stocked museum contains ample material for illustration.

Instruction is given by text-books, lectures, collateral reading and by practice work in the hospital. The lectures are illustrated by means of skeletons, manikins, charts and by the living animal. Anatomy of locomotion, conformation, the digestive organs, and the higher physiology of digestion are given prominence.

Infectious diseases of domestic animals are studied with references to causes, recognition, prevention and methods of control. Certain medicines which the intelligent stockman should understand are studied with reference to uses, doses and methods of administration.

COURSE IN FORESTRY

The course in Forestry is a four-year course intended to prepare men to take charge of private forest properties or for the government forestry service, or for positions as teachers. It leads to the Degree of Bachelor of Science in Forestry.

The first year in this course, for those who enter other than from the Minnesota School of Agriculture deals with the elementary agricultural subjects with which it is important for every manager of rural properties to be familiar. The forester is largely thrown upon his own resources and should be capable of advising as to the best way of managing the farms or grazing lands that are always included in large forest properties. The sophomore, junior and senior years include besides the course in technical forestry, courses in the College of Science, Literature and the Arts in all the auxiliary sciences which bear upon forestry in any way.

Special emphasis is laid on the value of field work and excursions. Every student is required before graduation to take four weeks' work in some lumber camp, so as to become familiar with common lumbering operations. There will also be excursions to near by forests, to lumber camps, saw mills, wood manufacturing and paper mills; to the Boom Company's work on the Mississippi river; to near by nurseries; and it is expected that arrangements will be made which will afford an opportunity for students to visit some of the forests of Montana, Idaho and Washington at a very low rate.

Equipment. The vast lumbering operations in the northern part of the state offer the best opportunities for a study of that branch. The establishment of the Chippewa Forest Reserve and its management by the Forest Service give opportunities which few other sections possess to study the best methods of forest management. The State has twenty-one thousand acres of timber to be used as a forest and game preserve, on which student help will be largely used. Itasca State Park, 22,000 acres in extent, is used by the Forestry School as a demonstration forest and experiment station. Every student spends about twelve months in the park during his course and does practical work in all branches. The use of this park gives the Minnesota Forestry School a forest equipment which is unsurpassed anywhere.

Throughout the year, special lectures will be given by the State Forestry Commissioner, the State Game Warden, the State Fish Commissioner and prominent lumbermen and lumber manufacturers of Minneapolis and St. Paul. This touch with the commercial side of the lumber business is very important and the situation of the school makes it possible to offer a great deal of it. Other special lectures will be presented as opportunity offers.

COURSE IN HOME ECONOMICS

The course in home economics offered in the College of Agriculture is open to graduates from the School of Agriculture who have taken the work of the intermediate year, and to graduates of approved high and normal schools. It is intended to bring to the vocation of home making the same kind of help which the course in agriculture brings to the business of farming. Aside from the universal need of education of this character, there is a marked and increasing demand for trained women to fill institutional positions, not only as special teachers in the several divisions of home economics, but also in administrative positions as competent supervisors of supplies and of hygiene where large numbers are cared for in collective housekeeping. A four-year course is offered in home economics, leading to the degree of Bachelor of Science in Home Economics.

In addition, a short two-year normal course (page 1) is offered in home economics, which includes all the special technical subjects given in the four-year course in the College of Agriculture at the University Farm, but does not include the required general cultural studies which are given in the College of Science, Literature and the Arts. Those who complete this course receive a certificate.

Graduates of other reputable colleges can here secure a Bachelor's degree by devoting two years to the subject of Home Economics. The major work must be done in Home Economics and one or both of two minors must be·completed under the advice of the college committee in one of the other divisions of the College of Agriculture, or in the College of Science, Literature and the Arts. When aproved by the dean and college committee, other subjects given in these colleges may be submitted for the prescribed subjects in the course in home economics.

Women who are sufficiently advanced may study music or art during the junior or senior years, provided that no student may receive more than two semesters' credit in music and art together.

DOMESTIC ART

This course is planned to give students a thorough training in all those branches which bear upon the decorating and furnishing of the home and upon the healthfulness and appropriate clothing of the body. It is intended to develop independence and resourcefulness in the creation of beautiful surroundings through a familiarity with the scientific, economic and artistic principles governing the material shaping of the household to the needs of its occupants. Architecture is studied in relation to the practical needs of the home as well as the economical and tasteful arrangement of the interior of the house and its furnishings. The underlying principles of true decorative art are emphasized—those principles which embody taste rather than a great expenditure of money. The same principles are applied to the clothing of the body and to all departments of design, whether for dress, furniture or decoration.

The course is not confined to sewing or actual home adornment but covers a number of branches of hand work connected with the home and adapted to the public schools and to industrial education. Needle work, leather work, pottery, weaving, basketry, rug making, crocheting and knitting are included. Each subject is considered in its simplest form for teaching very young children and in its possibilities of greater skill for more advanced grades.

Equipment. The instruction in domestic art is given in the Administration building of the Department of Agriculture. Two large class rooms, a lecture room, a museum and rooms for special work are provided. The class rooms are commodious and especially equipped for instruction in sewing, garment drafting and the study of textile fabrics. The museum contains collections for the study of household art, including useful and ornamental materials for the home, and collections illustrating the quality of fabrics as affected by manufacturing. The museum is also used as a laboratory for advanced students.

OUTLINE OF COURSE IN AGRICULTURE.

(Numbers after subjects indicate hours per week.)

FRESHMAN YEAR.

DIVISION "A."

For graduates of the School of Agriculture.

FIRST SEMESTER.	SECOND SEMESTER.
Mathematics, [3]	Mathematics, [3]
German, [5]	German, [5]
Botany or Zoology (long) [6]	Botany or Zoology (long) [6]
Geology, [3]	Drawing I. [4]
Rhetoric, [3]	Rhetoric, [3]
Hort. and Dairy Practicums [3]	Hort. and Dairy Practicums [3]
Military Drill, [2]	Military Drill, [2]

FRESHMAN YEAR.

DIVISION "B."

For graduates of approved high schools or others of equal standing. Students in this division take part of their work in classes of the School of Agriculture. For description of these courses see statement under School of Agriculture.

FIRST HALF OF FIRST SEMESTER.

Farm development, [3]
Forestry, [3]
Dairy Chemistry, [3]
Carpentry [4]
Entomology, [3]
Fruit Growing, [3]
Library Classification, [5]
Field Crops [4]

AGRICULTURAL SCHOOL YEAR.

FIRST TERM.	SECOND TERM.
Dairy Husbandry, [3]	Dairy Husbandry, [3]
Breeding, [2]	Feeding, [2]
Agricultural Chemistry, [5]	Soils and Fertilizers, [5]
Fruit Growing [3]	Vegetable Gardening, [3]
Veterinary, [2]	Veterinary, [2]
Entomology, [5]	Study of Breeds, [5]
Physics, [5]	Drawing [4]
Forestry, [3]	Economics, [3]
Military Drill, [2]	Blacksmithing [4]
Gymnasium, [2]	Military Drill, [2]
Carpentry [4]	Gymnasium, [2]
	Farm Accounts, [4]

LAST HALF OF SECOND SEMESTER.

Chemistry, [3]
Poultry, [3]
Farm Accounts, [4]
Blacksmithing [4]
Plant Propagation, [4]
Farm Machinery [4]

Farm Development, [3]
Stock Judging, [2]
Live Stock Practicums, [2]
Field Crops, [4]
Drawing, [4]
Veterinary, [2]

SOPHOMORE YEAR.

Botany or Zoology, long, (A) [6]
Botany or Zoology, long, (A) [6]
Botany, short, (B) [6]
Zoology, short, (B) [6]
Scientific German or French, [3]
Chemistry, [3]

Agricultural Physics, [3]
Rhetoric, [1]
Agricultural and Animal Husbandry Practicums [4]
Military Drill, [2]

JUNIOR YEAR.

FIRST SEMESTER.	SECOND SEMESTER.
Industrial Botany, [6]	Plant Pathology, [3]
Foods, [2]	Soils and Fertilizers, [4]
Thremmatology, [3]	Farm Management, [3]
Taxonomy, (B), [6]	Veterinary elective, [2]
Agricultural elective, (A), [3]	Taxonomy, (B), [6]
Academic elective, [3]	Farm Structures I. [3]
Principals of Feeding, [3]	

SENIOR YEAR.

Field Crops, [2]
Farm Structures I. [2]
Comparative Physiology, [3]
Elective, [3]
Elective, [3]
Elective, [3]

Stock Judging, [3]
Agricultural elective, [3]
Horticultural elective, [3]
Elective, [3]
Elective, [3]
Elective, [3]

JUNIOR AND SENIOR ELECTIVES.

AGRICULTURE.

Animal taxonomy.
Greehouse management and floriculture.
Animal Breeding.
Plant breeding (Horticulture).
Plant breeding (Agriculture).
Agricultural Engineering.
Dairy management.
Chemistry III, VII, VIII, laboratory.
Chemistry IV, V, lectures.

Diseases of animals.
Bacteriology.
Economic Entomology.
Field crops and seeds.
Agricultural Economics.
Bibliography of agricultural literature.
Research (dairy, animal husbandry, horticulture, agriculture.)

ACADEMIC.

Botany.
Economics.
Literature.
Geology.

Psychology.
History.
Education.
Rhetoric.

ANIMAL HUSBANDRY

Students who wish to specialize in Animal Husbandry are recommended to arrange their courses in the Junior and Senior years as follows, and, in addition, elect the long course in zoology and the short course in botany.

JUNIOR YEAR.

Zoology, (long) [6]	Zoology, (long) [6]
Meats and judging, [3]	Stock Breeding, [3]
Thremmatology, [3]	Elective, (animal husbandry) [3]
Principles of Feeding, [3]	Farm Structures I. [3]
Elective, [3]	Elective, [3]
Elective, (animal husbandry) [3]	Elective, [3]

SENIOR YEAR.

Animal feeding, [3]	Veterinary Elective, [2]
Farm Structures II. [3]	Animal Nutrition Studies, [3]
Animal Husbandry Research, [3]	Animal Husbandry Research, [3]
Comparative Physiology, [3]	Academic Elective, [3]
Academic Elective, [3]	Elective, [3]
Elective [3]	Elective, [3]

JUNIOR AND SENIOR ELECTIVES.

Anatomy.
Dissection.
Stock Judging.
Agricultural Economics.
Foods.
Stock Farm Management.
Animal Taxonomy.
Home Dairying.
Dairy Stock and Dairy Farm Management.
Diseases of Animals.
Animal Mechanics.
Stock Records and Compilations.
Bibliography of Agr. Literature.
Field Crops and Seeds.
Animal by-products.
Advanced Meats and Judging.

OUTLINE OF COURSE IN FORESTRY.

(Numbers after subjects indicate number of hours per week.)

FRESHMAN YEAR.

Same as Freshman year in the Course in Agriculture.

SOPHOMORE YEAR.

FIRST SEMESTER.	SECOND SEMESTER.
Botany, [6]	Botany, [6]
Rhetoric, [1]	Rhetoric, [1]
Zoology, [6]	Zoology, [6]
Elements of Silviculture, [3]	Trigonometry, [3]
German I, [5]	German I, [5]
Geology I, [3]	Economics IX, [3]
Physics [1½]	Physics [1½]
Drill, [2]	Drill, [2]
Drawing, [4]	Drawing, [4]

JUNIOR YEAR.

FIRST SEMESTER.	FEBRUARY TO APRIL.
Taxonomy, [6]	Land Gard. [3]
Economics, [3]	Carpentry [4]
Lumbering, [3]	Lumber Grading [3]
Protection, [3]	Plant Propagation [3]
Chemistry V and VIIb. [3]	Diseases of Horses [3]
German III, [3]	
Forest Entomology, [3]	

ITASCA PARK—APRIL TO SEPTEMBER.

Seeding.
Surveying.
Mensuration.

Road Building.
Thinning.
Packing.

SENIOR YEAR.

FIRST SEMESTER.	SECOND SEMESTER.
Working Plans, [3]	Taxonomy, [6]
Utility, [3]	Chemistry IX, [3]
Physiography, [3]	German III, [3]
Dendrology, [6]	Petrograhy, [3]
Law of Contracts, [3]	Dendrology, [6]
Forest Literature, [3]	Economics IV, [3]
Forest Management and Economics, [3]	Ecology, [6]

OUTLINE OF COURSE IN HOME ECONOMICS.

(Numbers after subjects indicate number of hours per week.)

FRESHMAN YEAR.

DIVISION "A."

Required of those who are graduates of the School of Agriculture only.

FIRST SEMESTER.	SECOND SEMESTER.
Mathematics, [3]	Mathematics, [3]
Geology, [3]	Chemistry I. a., [3]
German or French, [5]	German or French, [5]
Rhetoric, [3]	Rhetoric, [3]
Drawing I. [4]	Designing, [4]
Physical Training, [2]	Physical Training, [2]
Domestic Science or Domestic Art Practicums, [3]	Domestic Science or Domestic Art Practicums, [3]

FRESHMAN YEAR.

DIVISION "B."

For graduates of approved high schools or others of equal standing. Students in this division take part of their work in classes of the School of Agriculture. For description of these courses, see statement under School of Agriculture.

SEPTEMBER.

Agriculture, [3]
Dairy Chemistry, [3]
Fruit Growing, [3]
Library Classification, [5]

Cooking, [4]
Laundry Work, [4]
Sewing, [4]
Free Hand Drawing, [4]

AGRICULTURAL SCHOOL YEAR.

FIRST TERM.

Dairying, [4]
Agricultural Chemistry, [3]
Fruit Growing, [3]
Entomology, [5]
Physics, [5]
Forestry, [3]
Drawing [4]

Physical Culture, [2]
Cooking, [4]
Social Culture, [1]
Sewing, [4]
Household Art, [2]

SECOND TERM.

Vegetable Gardening, [3]
Domestic Chemistry, [3]
Free Hand Drawing, [4]
Dairy Husbandry, [4]
Economics, [3]

Cooking, [4]
Home Economy, [2]
Sewing, [4]
Meats, [1]
Domestic Hygiene, [1]

LAST HALF OF SECOND SEMESTER.

Farm Accounts, [4]	Home Hygiene, [1]
Poultry, [3]	Bacteriology, [1]
Chemistry, [3]	Cooking, [4]
Designing, [4]	Sewing, [4]
Home Economics, [3]	Meats, [3]
Household Art, [3]	Vegetable Gardening, [3]

SOPHOMORE YEAR.

FIRST SEMESTER.	SECOND SEMESTER.
Chemistry I. B., [3]	Chemistry II, [3]
German or French, [3]	German or French, [3]
English Literature, [3]	Elements of Psychology, [3]
Botany short, [6]	Botany short, [6]
Zoology short, [6]	Zoology short, [6]
Elective, [3]	Elective, [3]

JUNIOR YEAR.

Domestic Economics I, [3]	Domestic Science III, [4]
Domestic Economics II, [3]	Domestic Art II. [3]
Domestic Science I, [4]	Chemistry IV, [3]
Domestic Art I, [4]	Chemistry VI b, [3]
History of Education, [3]	History of Education, [3]
Chemistry III, [3]	Farm Structures [3]
Bacteriology, [1]	Elective, [3]

SENIOR YEAR.

Domestic Economics III, [3]	Domestic Economics III, [3]
Psychology, [3]	Floriculture, [3]
English Literature, [3]	Practice Teaching, [3]
Physiology, [3]	Domestic Science II, [4]
Drawing II. [3]	Domestic Art IV, [4]
Elective, [3]	Elective, [3]

NORMAL COURSE.

FIRST YEAR.

(Same as Freshman year, Division "B," of course in Home Economics.)

SECOND YEAR.

FIRST SEMESTER.	SECOND SEMESTER.
Domestic Economics I, [3]	Domestic Science II, [4]
Domestic Economics II, [3]	Home Economics, [3]
Domestic Science I, [4]	Domestic Art III, [3]
Domestic Art I, [4]	Domestic Art IV, [4]
Bacteriology, [1]	Drawing, [4]
Rhetoric, [1]	Rhetoric, [1]
Botany short, [6]	Botany short, [6]
Psychology, [3]	Child Psychology, [3]
Chemistry I. b, [3]	Chemistry IV, [3]
Practice Teaching, [3]	Practice Teaching, [3]

AGRICULTURE.

Unless otherwise specified all courses continue throughout one semester and are three credit hour courses.

Course I. Field Crops and Seeds. Senior II. Bull.

Students registering for the course must have had at least one year's work in University Botany. The course is outlined to occupy two lecture periods and two laboratory periods per week.

(*a*) *Seeds: their identity and value.*
In this course the students are made acquainted with the physical botany, the uses, identification, vitality, testing, grading and judging of all classes of field seeds. Special attention is given to the reproducing value of seeds of various grades of grains and to the importance of testing. A thesis upon some phase of the subject of seeds is required for full credit.

(*b*) *Field Crops: their structure and use.*
In this course are considered the botany, cultivation, and economic value of the various cereal, forage, root, fiber, sugar and miscellaneous crops. Special attention is given to the subjects of meadows, pastures, soilage crops, and to the production and preservation of all kinds of dry cured and ensilaged crops.

Course II. Thremmatology. Junior I. Bull.

Heredity, variation, law of breeding, the art of breeding, improvement by nature and under scientific experimentation, securing foundation stocks, value of using very large numbers, immense value of the occasional individual which can transmit qualities of peculiar value, use of an ideal, use and misuse of the score card, both numerical and graphic, intrinsic qualities, fancy points and distinguishing marks, statistical methods in breeding pedigree records of efficiency, fundamental principles underlying the arrangement of the record books, bibliography and terminology, study of the literature of breeding.

Course III. Plant breeding.

Botany of the reproductive organs of field crops, field crop nursery management, producing new qualities by hybridizing and by change of environment, hybridizing versus cross-breeding, in-breeding and self fertilization, originating varieties and improving standard varieties by selection and by hybridizing, followed by selection, methods of disseminating new varieties, seed and plant introduction, experimentation in the theories relating to heredity, variation and practical breeding, seed growing as a farm business, seed merchandising. The breeding of each of the various field crops grown in Minnesota .

Course IV. Agricultural engineering. Elective II. Wilson

Subduing prairie and timber soils, land drainage, farm land mensuration and surveying; irrigation and irrigation works; roads, their location, maintenance, laws and construction, financial support; farm fences, buildings, implements and machinery.

Course V. Agricultural economics. Elective II. Parker

Labor, farm finances, markets, rentals, agricultural statistics, production, exports, wages, land laws, ownership, taxes, organizations.

Course VI. Farm management. Junior II. Wilson

In this course are considered the planning of farms, crop rotation, tillage, and systems of farming. Special attention is given to revising and drafting farm plans and to arranging economic crop rotations, and application of business methods to farm operations.

Agricultural practicums. Opportunities to gain practical experience, to acquire greater manual dexterity in doing farm work, to secure practice in conducting experiments and to get experience in teaching agricultural subjects, are offered to college and graduate students, when practicable. Students should arrange early in their course for this work, as the opportunities in plant breeding, in rural engineering, in field crops, in agricultural statistics and in assisting instructors in the various courses are available only at irregular intervals and must be arranged for in advance.

AGRICULTURAL CHEMISTRY AND SOILS.

Course I. (a) *General agricultural chemistry.*
[One-half semester.] Freshman II. Wilhoit

Recitations, lectures and laboratory practice. Particular attention is given to the study of the elements and compounds which are of the most importance in agriculture. The laws governing the combination of the elements by weight and volume are illustrated by numerous problems. The writing of equations, chemical nomenclature, and the periodic system of classifying the elements are prominent features of the work. In the laboratory, experiments are performed illustrating the general laws of chemistry which have a bearing upon animal and plant life.

(b) A continuation of I. (a). Sophomore I.

Course II. Agricultural qualitative analysis. Sophomore II. Wilhoit

This course is arranged to meet the wants of agricultural students. Six hours per week are given to the laboratory work and one period to a lecture and recitation. The writing of equations and the study of principles involved in the separation of the various groups and individual compounds of elements are characteristic features of this work. It is the object of this course to familiarize the student with the processes employed in qualitative analysis, so that he may be able to determine the composition of all ordinary substances, particularly of those that are of the most importance in agriculture.

Course III. Agricultural quantitative analysis. Elective I. Snyder

An elementary course in quantitative analysis. The principles involved in gravimetric and volumetric analysis are studied. Three periods per week are given to laboratory work and one period to a recitation and lecture. The work includes the gravimetric and volumetric determinations of iron, acidimetry and alkalimetry, the gravimetric determination of phosphorus pentoxide, the volumetric determination of calcium oxide and determination of nitrogen and potassium oxide. The object of this course is to prepare the student for special work in agricultural chemistry, and is required of all students who elect either courses VI. or VII.

Course IV. Human and animal foods.
[One-half semester.] Junior I. Snyder

Lectures. This course treats of the composition, digestibility and nutritive value of human and animal foods. The chemistry of plant growth, particularly the factors which influence their composition and nutritive value, forms an essential part of this course. The processes employed in the preparation of foods as the milling of wheat and other cereals, the economic uses of human and animal foods, the comparative value of foods, and the methods employed in nutrition investigations, particularly in proteid and carbohydrate metabolism and the losses of energy from the body are studied. Dietary studies, the cost of foods, and influence of different methods of preparation upon their nutritive value are also included in the work. It is the object of this course to familiarize the student with the fundamental principles of nutrition and the use of the literature upon the subject. Special attention is given to the economic production of foods and their utilization for human and animal food purposes.

(This course is given only in alternate years. Given during the last half of the second semester 1909.)

Course V. Soils and fertilizers. [One-half semester.] Junior II. Snyder

Lectures. This course treats of the relation of soils and their fertility to the production of crops, and includes a study of the sources of plant food and the influence of tillage and manures upon the chemical and allied physical and biological changes which take place in the soil in rendering plant food available. Rock disintegration and soil production, the various types of soil formed from different kinds of rocks and their agricultural value, and the inherent fertility of soils form an essential part of the work. The control of the water in the soil, soil solutions, and leachings, the presence of injurious acid compounds, and alkaline salts, the various methods employed for the improvement of soils, soil organisms and their influence upon fertility, the organic compounds of the soil and the part which they take in soil fertility, the increase and decrease of the organic matter and the nitrogen of the soil as influenced by different methods of farming, manures, and the causes of soil exhaustion and means employed, the analyses of soils, and the application and interpretation of the results, uses of commercial fertilizers and green and farm fertilizers for conservation of fertility, adaptability of crops to soils and rotation of crops as affecting the fertility of the soil are some of the topics discussed. Soil judging, rating, and scaling form a part of the work.

(This course is given in alternate years; given in the last half of the second semester 1908.)

(Courses I., II. and III. are required as preparatory work for courses VI. and VII.)

Course VI. The analysis of foods. I. or II. Elective. ***Snyder***

This work includes the determination of water, ash, starch, sugar, cellulose, pentosans, fats, proteids, and the different forms of nitrogen in food stuffs, the use of the calorimeter, and the polariscope in food analysis. Before completing the work, each student makes a complete proximate analysis of some food material. This course is planned to meet the wants of those who desire to become familiar with the methods employed in the analysis of foods and in nutrition investigations.

(*b*) *Analysis of dairy and animal products. II.* [One-half semester.]

This course includes the analysis of fodders, milk, butter, cheese, and animal feces. Special features of the course are the determinations of volatile fatty acids, iodin absorption, specific gravity, and the saponification equivalent of fats. The object of this course is to meet the wants of those who desire to become familiar with the methods of investigations employed in research in dairy chemistry.

(*c*) *The technical analysis of wheat flour and cereals.* I or II.

The study of the roller process of flour production, the grading and testing of wheat for technical purposes, the testing of flour by chemical methods and the bread making value of flour as determined by comparative baking tests. Ample facilities are offered for this work as the laboratory is equipped with a complete miniature flour mill capable of producing the various grades of flour.

Course VII. The analysis of soils and fertilizers.

(*a*) *The chemical analysis of soils.* Elective. Snyder and Wilhoit.

Laboratory practice in the chemical analysis of soils and the study of the chemical methods employed in soil investigations. Particular attention is given to the study of the organic compounds of soil, and an opportunity is offered for the study of experimental soil work applied to field investigations.

(*b*) *The physical analysis of soils.* Junior I. [One-half semester.]

Laboratory practice in the physical analysis of soils by means of Hilgard's elecutrator, and the sedimentation methods as modified by the use of centrifugal apparatus.

Courses VII (a) and VII (b) are intended for students who desire to make a specialty of the subject of soils.

Course VIII. Special problems. Elective. Snyder, Hummel and Wilhoit.

Seminar and laboratory work in the study of special problems in Agricultural Chemistry, as the analysis of water for irrigation purposes, the adulteration of foods, dietetics, and problems in agricultural technology.

Course IX. Chemistry of forest by-products. Senior II. Hummel.

In this course a special study is made of the products of the forest other than for timber and fuel. The products studied include cellulose for the manufacture of paper, sugar, tanning materials, turpentine, tar, oils, resin, waxes, gums, creosote, wood alcohol, acetic acid, acetone, essential oils, charcoal, camphor, and medicinal products. The subjects of paint and methods for the preservation of wood are also taken up.

At the beginning of the course, a short time is devoted to a review of organic chemistry, special attention being given to those compounds found in wood or closely related to it. A thesis on some subject relating to the chemistry of forest byproducts is required in this course.

Course X. Domestic Chemistry and Dietetics. Elective. Snyder. [One-half semester.]

Lectures given every two years; given the second semester of 1908.

ANIMAL BIOLOGY.

I. *General Zoology.*

I, II. Text books, lectures, quizzes and laboratory work.

The course includes the elements of Entomology, a general survey of the phyla of the animal kingdom and the elements of embryology.

I. *Zoology.* Extension of course I.

This course may be pursued either in connection with course I., thus completing a "long course" in General Zoology during the first year, or independently by those sufficiently prepared. The object of the course is to acquaint the student with more representatives of the phyla of the animal kingdom and to give him practice in the use of references.

III. *Histology.*

Prerequisite, course I, II.

Lectures, quizzes, references and laboratory work, five or six hours a week.

(a) General Histology. A comparative study of the characters, properties and development of animal tissues.

(b) Vertebrate Organology. The microscopic anatomy of the organs of vertebrates.

So far as possible the student will prepare the material himself and thus acquire not only a collection of personally-made preparations, but also a practical knowledge of histological methods and technique.

The text book and principal references are: Szymonowics-MacCallum. A Text-Book of Histology and Microscopic Anatomy; Bohm and Davidoff-Huber, Text-book of Histology; Schneider, Lehrbuch der vergleichenden Histologie der Tiere; Oppel, Lehrbuch der vergleichenden mikroskopischen Anatomie der Wirbelthiere; Hertwig, Zelle und Gewebe; Wilson, The Cell; and others.

VII. *Taxonomy.*

Prerequisite, course I. Days and hours are arranged with the instructor.

(a) Systematic Entomology.

The course covers the general classification of insects and special problems in entomology.

(b) Ichthyology.

The classification of fishes, with detailed work on the fishes of Minnesota.

(c) Ornithology.

The classification of birds, with special reference to the birds of Minnesota.

VIII. *Physiology.*

Open to all juniors and seniors. Lectures, text-book and demonstrations.

This course will alternate with course IX. It will be offered during 1908-9 and not during 1909-10.

ANIMAL HUSBANDRY.

Course I. Stock breeding. Junior II. [First half semester.] Boss

Discussion of the principles of stock breeding as affecting breed maintenance and breed formation; standards of excellence and comparison of standards of breeds; heredity and the influences affecting it; prepotency, fecundity and their relation to successful breeding; the influence of nutrition on animal growth and form and the effect of artificial conditions, early maturity, selection and pedigree.

Course II. Principles of feeding. Junior I. [Last half semester.] Boss

The principles of nutrition and digestion as applied to economical production; feeding rations and nutritive ratios, feed stuffs and methods of feeding, feeding of breeding stock and show stock, management of animals during pasture, yard and stall feeding for the block; feeding for specific production of wool or flesh, selection of animals for the feed lot, stabling suitable for the various classes of live stock.

Course III. Stock judging. Elective I. Gaumnitz.

This course is calculated to meet the needs of students desiring to become expert stock judges and of those who wish to study animal form with a view of becoming breeders of superior animals.

Score card work in combination with the presence of living specimens is a feature of this course. Students are drilled in judging from the standpoint of breed, type, form, stamina, quality, breeding capacity, suitability for feeding and for general and specific production. Special opportunities are given for judging live animals fitted for the block and in judging the dressed carcasses after slaughter, thus determining by observation the quality of animals judged.

Live stock practicums: Feeding and stable management of cattle, horses, sheep and swine, recording and calculating amounts of pasturage obtained from different forage crops, keeping herd records, writing pedigrees and recording animals, calculating feeding records and cost of production, mechanical analysis of carcasses of animals to determine total amount of meat, and proportionate amounts of fat and lean, determinations of fat and lean meat with especially designed apparatus; calculating percentage of different parts of the carcasses.

Course IV. Stock farm management. .. Elective I. Wilson.

In this course, special attention is given to the crops and rotations that fit in with live stock farming, economy of feeds and pasture production, and solution of confronting problems is made the leading feature.

Course V. Animal nutrition studies. Senior II. Boss and Gaumnitz. [First-half semester.]

Original work in solving some special live stock problems related to meat production followed by a thesis; sufficient work must have been done to make it reliable.

Course VI. Animal husbandry research. Elective I or II. Boss.

This course will consist of reviewing literature upon different phases of animal husbandry production. The experiment station records and other sources of information will largely be used. This together with original work will form the basis of extended compilation of valuable material on live stock husbandry.

Course VII. Meats. Freshman II. [Last-half semester.] Boss.

A continuation of studies in meats as outlined in the school course. Supplemented by dissection and studies of muscular structures of various kinds of meats.

Course VIII. Meats and judging. Junior I. Gaumnitz.
This course is designed especially for studying meat making animals and their products. Under general guidance each student makes up rings of animals which he studies in detail, at every step from the live state until the different parts are cooked and tested at the table. Full records and conclusions as well as illustrations are required in thesis form.

Course IX. Advanced meat studies and judging. Elective II. Gaumnitz.
Work along this line is a continuation of that begun in course VIII. More attention is given the more important details concerning meat and a minute study of its physical and chemical compositions is required.

Course X. Stock records and compilation. Elective I or II. [One-half semester.] Boss and Gaumnitz.
This will consist of a thorough study of systems of keeping and compiling stock records upon stock farms and at Experiment Station. Sufficient actual practice will be required to become familiar with live stock records.

Course XI. Animal by-products. Elective II. [Last-half semester.] Boss and Tomhave.
Individual study of the by-products manufactured at the large packing houses will be required of each student. The value and place that each has in economic use is considered.

Course XII. Animal mechanics. Elective II. [One-half semester.] Gaumnitz.
A study of the mechanical effects of different relationships of bone and muscle in the animal body. This applies particularly to horses. The entire feet and legs as well as the body will be studied and made clear by apparatus and original illustrations.

BOTANY.

I. *General Botany.* I, II.
This course comprises a general survey of the plant kingdom with laboratory work on the cell, on algae, lichens, fungi, mosses, ferns, gymnosperms and flowering plants. Lectures and laboratory. Open to all.

II. *General Plant Morphology.* First year. I, II.
This course comprises a thorough laboratory discipline in bacteria, algae, fungi and lichens, and also includes a brief survey of economic plants. It is the prerequisite for course III. Lectures, laboratory and collateral reading throughout the year. Open to all.

III. *General Plant Morphology.* Second year. I, II.
A view of mossworts, ferns and flowering plants is given, with lectures, laboratory work and collateral reading throughout the year. Open to students who have completed course II. of which it is a continuation.

IV. *Taxonomy.* Junior or senior. I, II.
Lectures, reference reading and herbarium work. The course is primarily designed to afford students an opportunity to become proficient in the determination of plant species. Open to those who have completed course I or III.

V. *Cytology.* Junior or senior. I, II.
Laboratory work and collateral reading. The course includes a survey of cell structure and the various phenomena of division, fusion and metamorphosis, together with a review of the history of cytologic investigations from the time of Malpighi and Grew to the present. Assignments from the work of Strasburger, Henneguy, Hertwig, Wilson, Guignard, Beneden and Driesch will be made and methods of cytological research indicated in the laboratory. Open to those who have com-

pleted course III or IV. Open also as a major or minor to candidates for the degree of master of science.

VI. *Algology.* Junior or senior. I, II.
Lectures, laboratory and reference work. Instruction is also given in the preservation of material. The work of the first semester includes a detailed comparative morphological and taxonomic study of the freshwater algae; Cyanophyceae and Chlorophyceae, (with a systematic examination of the forms found in the Minneapolis water supply) and a similar course in the seaweeds, Phateophyceae and Rhodophyceae. Either semester may be taken as a unit. Open to those who have completed course III. Open also as a major or minor to candidates for the degree of master of science.

VII. *Plant Ecology.* Junior or senior II.
Lectures, collateral reading and field observations. The course is designed to cover generally the domain of adaptational adjustments in plant embryology, anatomy, physiology and distribution. Particular attention is devoted to the problems of ecological distribution. Open to those who have completed course I or III. Open also as a minor to candidates for the degree of master of science.

DAIRY HUSBANDRY.

Course I. Dairy stock and dairy farm management. Elective II. Haecker.
Lectures, first semester, three hours per week. Practice work one hour per week. This course is given during the first semester. The lectures cover the breeding, rearing and management of dairy stock, the points and characteristic essential in animals intended for the dairy, practice work in judging dairy stock, and the management of the dairy herd.

Course II. Principles of feeding. Junior I. [First half semester.]
Lectures first half first semester on the principles of nutrition and the scientific problems underlying animal production and economic feeding. Practice work is given in formulating rations, in estimating the comparative value of food stuffs and in other problems connected with the subject.

Course III. Factory dairying. Elective II. [Last half semester.]
This is offered during the session of the dairy school, beginning November 18. Lectures in the forenoon on dairy bacteriology, dairy chemistry, the care of milk and cream, lactic cultures, flavors, creamery milk, cream ripening and churning, working and packing butter. In the afternoon, students are given two and a half periods practice in the factory training rooms and in the dairy laboratory.

Dairy practicums: Students are offered training two semesters in compounding rations, feeding cows, rearing calves, milking and many other details in the management of the dairy herd; operating hand separators, and other modern farm dairy appliances, the manufacture of butter and cheese and work in the dairy laboratories.

DOMESTIC ART.

Course I. Textiles. Junior I. Blair.
Animal and vegetable fibers, weaves and dyes, testing fabrics for household use and personal wear, the hygienic values of various fabrics and harmony of color. This course is designed especially to assist the teaching of sewing in graded schools, and includes the preparation, explaining and making of models suited to grade work in the public schools.

Course II. Garment drafting and dress. Junior II. Blair.
Subjects treated are the designing and drafting of children's

and adult's garments; the study of color and its relation to dress; materials in dress; dress in relation to health; history of dress from the fourteenth century.

Course III. Household Art. Senior II. **Blair.**
This work includes lectures and practice work; location and building of the home; color in house painting; interior arrangement and decoration; furnishing of the home in relation to the study of furniture, historic and modern, with all the details connected with comfort and adornment.

Course IV. Handicraft. Senior II. **Blair.**
Weaving, basketry, crocheting, knitting, rug making, leather work and pottery will be studied in their simpler forms.

DOMESTIC ECONOMICS.

Junior I. Boutelle
This course deals with the problems of economics arising in the home; generic lines of expenditure; values; business methods; standards of living; constructive agencies for economic betterment in the home. Lectures, problems and recitations.

Course II. Evolution of the home. Junior II. [One-half semester.] Boutelle.
The home as a social and economic institution and its evolution from primitive conditions; evolution of industrial, social, religious and economic influences in the home; the relation of the home to civic life. Lectures and recitations.

Course III. Home administration. Senior II. [One-half semester.] Junior I. Boutelle
The organization and maintenance of a home; the home as a place and an opportunity for the right development of the physical and spiritual natures; co-operative housekeeping; family hotels. Lectures, problems and recitations.

Course IV. Domestic hygiene. Elective II. [First half of semester.] Reynolds
Lectures twice a week during the second half of the second semester of the freshman year. The more common ailments connected with school work and their prevention; dietetics including water, ice, milk, meat, fish and canned goods, etc.; sanitation of farm buildings and their surroundings; dangers from the uses of public conveyances, telephones, drinking cups, etc.

Course V. Bacteriology. Junior I. **Beebe.**
Lectures once a week during the second semester of the junior year. Domestic bacteriology; bacteriology of the common infectious diseases.

DOMESTIC SCIENCE

Course I. Food economics. Junior I. **Shepperd.**
Selection of food materials: (1) Marketing; buying by sample; cost and value; quality as to freshness, flavor, etc. (2) Storage and care of foods, care of cupboards, cellars, refrigerators. (3) Selection, preparation and serving of foods for large numbers; equipment of large kitchen, serving rooms and dining rooms. (4) Kitchen practicums, arrangements, equipment and methods of directing practice work in cooking.
Preparation of foods: (1) Meat products, as beef tea, beef powder and beef extracts. (2) Cereal products and materials made from flours and meals, methods of aerating dough, leavening agents, etc. (3) Manufactured beverages, as cocoa and koumiss, matzoon, etc. (4) Condiments and spices. (5) Confections, as candies and sweetmeats. (6) Sweets, as sugars and syrups. (7) Commercial bakery products, as breads, biscuits, crackers, wafers, etc. (8) Preserving by drying, canning, refrigerating, and with preservatives, salts, sugars, spirits, fats and acids.

Course II. Management of kitchen and dining room. Senior II. Shepperd

Kitchen. The kitchen is regarded as a sanitary workshop in which the home maker can utilize all available scientific knowledge in the improvement of home conditions with the expenditure of a minimum amount of energy, time and money.

Dining-room. The importance of combining beauty and utility in the construction and equipment of a dining-room without infringing on the laws of sanitation is emphasized.

Silver, glassware, china and linen are discussed along the lines of beauty, manufacture, general utility and care. Bills of fare are discussed in order that students may become familiar with conditions in rural and urban homes, boarding houses, hotels, etc.

Course III. Laundering. Junior II. [One-half semester.] Shepperd

Removing stains; dyeing; setting colors; cleaning delicate fabrics, as silks, laces and fine wools; the use of cleaning agents; as soaps, volatile oils, and other chemicals; starches and bluing.

Commercial laundering and cleaning; power washing and ironing machinery; drying apparatus, etc.

DRAWING.

Course I. Free hand drawing. Freshman I or II. Clopath.

The study of nature forms including drawings from plants, landscape, animals and from figures posed. The study of perspective and drawing from objects. Exercises in composition.

Course II. Junior II. Clopath.

Exercises in the various forms of decorative work. Adaptation of plant forms, stencils, lettering. Original designs in different styles for articles of household use. Lectures on composition and principles of design.

ECONOMICS.

I. *Elements of Economics.* I. or II.

A thorough course in the elements of economics. The aim is to inculcate accepted doctrine, and show the nature and bearing of economic theory on present day problems. Given in each semester.

Text book, problems, lectures and discussions.

III. *Money and banking.* II.

A course open to students who have had course I.

Students desiring but one year's work in economics are advised to take this course following the work in elements of economics. If a longer course is desired, advanced economics should follow course III. This is an elementary course illustrated by constant references to monetary legislation. Text books, lectures, papers and discussions.

IV. *Modern industrial legislation.* II.

A course based upon McVey's Modern Industrialism. This course deals with the problems and legislation arising from industrial conditions such as labor questions, trusts, monopolies, etc. Assigned topics, lectures, and collateral reading.

VI. *Public Finance, Part I.* I.

Public expenditures, national, state and local, from the standpoint of public wants; budget framing; treasury administration and accounting; public debts in peace and war. Illustrations chiefly from American practice. Lectures and exercises.

VII. *Public Finance, Part II.*

The public revenue, national, state and local—from taxation and other sources. In particular, the principles and practice of taxation in the United States.

VIII. *Advanced Economics.* I.
In this advanced course further consideration is given to selected topics from the course in elementary economics. Carver's Distribution of Wealth and Taylor's Economics of Agriculture are used as texts, supplemented by readings and problems. Lectures, papers and discussions.

IX. Transportation. [2]. II.
The evolution of transportation in the United States and of railroads in particular. Economic aspects, public policy and finance of railroading.

EDUCATION.

Course I. in Philosophy and Courses I. and II. in Education are specified as necessary for the University Teacher's Certificate. One other three-hour course for a half year is required for this certificate and is elective from the courses in Education.

Graduates from Normal Schools who receive one year's credit at the University must fulfill the same conditions for the University Teacher's Certificate, but may not offer for this either course V. or course VII. in Education.

A long course in education means not less than six hours per week for one year, selected from the following list.

For additional information, consult the Bulletin of the College of Education.

I. *The history of education to the Renaissance.* Junior I.
An introductory study of early educational history, conducted by means of lectures, assigned readings, reports and discussions. The purpose of the course is to arouse an interest in educational problems, to secure some perspective for use in current investigation, with some command of the facts and some ease in the methods of educational history and study. An attempt is made to bring out education as one phase of civilization, and to show the connection of schools with other social institutions.

II. *History of Modern Education.* Junior II.
A continuation of Course I. with a somewhat intensive study of certain men, periods and systems in the history of modern education. This course is a direct preparation for an understanding of the educational systems, theories and practices of the present.

ENTOMOLOGY.

Course I. General entomology.
Freshman I. Washburn and Ruggles
Structure and classification of insects. The dissection of type, life history and habits of leading forms. Each student is required to make a collection of at least fifty insects.

Course II. Economic entomology. Elective II. Washburn and Ruggles
Lectures upon injurious insects of Minnesota and best methods of combating the same. The use of insecticides and spraying machinery. Beneficial insects.

Course III. Forest entomology. Junior I. Washburn and Ruggles
The students in this course must have a thorough, practical training in elementary entomology and economic entomology in order to put into practical use in field work the principles to be learned in both of these courses. The student will be directed in a special study of insects affecting the forest and will be encouraged in doing field work, collecting, identifying, and in the life history of forest insects.

Open only to students in the forestry course.

Course IV. Comparative anatomy and histology of insects. Elective II. Ruggles
A detailed study of structure of representatives of different orders of insects.
Six periods of laboratory work and one lecture. Must be preceded by course I. or its equivalent.

Course V. Elements of bee keeping. Elective II. Washburn
One lecture a week and work in apiary during spring term. Offered to those qualified for the work.

Course VI. Special Problems. I. or II. Washburn
For graduate students only. Consult the head of the department.

FARM STRUCTURES AND FARM MECHANICS.

(Junior or Senior Year.)

Course I. Designing and details of building construction. Junior II. Boss
Lectures and practice work are given in laying out plans for farm buildings. The questions of location, size, convenience, methods of construction, materials, heating systems, water systems, ventilation, sewage disposal, painting, durability, cost, etc., are discussed.

Course II. Design, construction and cost of buildings. Senior I. Boss
The practical application of principles given in Course I.
Each student selects an imaginary or real farm and makes drawings showing location of buildings, drives, yards, fences, etc., paying particular attention to properly locating each building and planning them so as to best meet the requirements of each individual farm and the means at hand for erecting them. Specifications and estimates of cost of buildings are also made.

Course III. Designing and details of building, construction. Junior II. Boss
Lectures and practice work in drawing. Location of farm buildings, drives, yards, etc., architectural designing, the study of plans, fittings and equipment; heating systems, ventilation, floors and wood work, painting and decorations.

Course IV. Designing, construction and cost of buildings. Elective I. or II. Boss
The practical application of the principles outlined in Course III.
Each student is required to lay out plans for an imaginary or real house, paying particular attention to location, sanitary conditions, heating, ventilating and general convenience.

FORESTRY.

Course I. Silviculture. Freshman I. [First half semester.] Detwiler
Study of forest conditions and the forests of the world. The writing of forest descriptions; the study of tree growth and the sylvics of the different species. Study of European sylvicultural methods and their adaptability to American conditions.
Lectures and field work.

Course II. Silviculture (Study of seeds and seed beds). Freshman I. [Last half semester.] Detwiler
Nursery practice. Seeding and planting of woodlands. The artificial formation and care of young forests.

Course III. Lumbering. Junior I. Cheyney
A detailed study of the methods of lumbering in use in all of the forest regions of the United States.
In connection with this course, the student is required to hand in a detailed and comprehensive report, written from actual observation, of some one logging operation. Lectures.

Course IV. Forest protection. Junior I. Detwiler
The general principles of forest protection. The study of all the methods and means of protection in use in Europe and America and their application in the different forest regions of the United States.

Course V. Surveying. Junior II. Cheyney

A course embodying all the principles of general surveying, but designed more particularly to fit the student for rough and rapid sketching methods. Practice in the use of the transit, level, plane table, sketching board, compass and barometer.

Lectures and field work.

Course VI. Utility. Senior I. Cheyney

A study of ways and means employed in the lumber business from the stump to the finished product in the yard.

Lectures and assigned reading.

Course VII. Working plans. Senior I. Detwiler

The study and discussion of the working plans in use in foreign countries. Criticisms of so-called working plans in the United States. This course requires the working up of a working plan in the United States.

Lectures and assigned reading.

Course VIII. Forest literature. Senior I. Cheyney

Assigned reading in all available forest literature and discussions thereof.

Course XI. Forest management and economics. Senior I. Green

A study of the principles governing the management of forests and the financial results from forests under management in Europe. The study of future yields.

The development of forestry in the United States and European countries; the forest conditions here and abroad and their effect upon the lumber industry; policies of different governments to forests.

Text book, lectures and recitations.

FRENCH LANGUAGE.

I. *French, beginning.* [5] I, II.

Fraser & Squair's French Grammar and Reader; modern texts.

II. *French,* second year's work. I, II.

Grammar and composition continued; modern texts will be read including selections from Merimée, Daudet and Scribe.

III. *Advanced Grammar and Composition.* I, II.

Francois' Introduction to French Composition; readings from modern authors including selections from Copée, Feuillet, Sandeau.

Open to those who have completed the French required for entrance.

IV. *Conversation.* [2] I, II.

A course in conversational French.

Open to students taking Courses II. or II.

GEOLOGY.

I. *General Geology.* Junior and Senior I.

Comprises: (1) Geodynamics, in which are set forth phenomena of the atmosphere, water, heat, gravity, and plants and animals as geologic agents; (2) Structural Geology, wherein stratification, displacement and veining of rock masses are described; (3) Physiographic Geology, pointing out prominent earth features and inquiring into the causes producing them; (4) An outline of Historical Geology.

Course II. Physiography of North America. Hall

A brief outline of the development of the continent is given, tracing its geological history and the forces accomplishing it. The physiographic conditions are then discussed; the distribution of forests, prairies and plains are studied, climatic conditions are traced and the physiographic and climatic influences determining the industrial development of the continent will be pointed out.

Lectures and reference work.

Course III. Geography of Forestry. Hall

This course will present the specific applications of geologic and physiographic conditions to the subject of Forestry. Forest regions will be described, their distinguishing features set forth and the causes which conspire to develop these features will be discussed. The relations of physiographic environment, particularly in rainfall and temperature will be constantly held in view.

Lectures and reference reading.

GERMAN LANGUAGE.

I. *German, beginning.* [5] I, II.

Pronunciation, grammar, selections in prose and verse. German conversation and composition (Bernhardt); short stories.

II. *German, intermediate.* I, II.

First semester—Selections from modern prose, narrative and descriptive; German lyrics and ballads. Second semester—A drama of Lessing, Goethe or Schiller. Open to students who have completed course I.

IIII. *Scientific Prose, intermediate.* I, II.

First semester—Hodge's German Science Reader (or equivalent). Second semester—Brandt and Day's German Scientific eRading. This course aims to give the student a reading knowledge of German for use in scientific studies. Open to students who have completed course I.

V. *Conversation and composition.* B I, II.

Translation into German of short English selections; conversation on topics of every-day life; narrative and descriptive essays, and letters in German. This course is designed to be supplementary to courses II, II.

HORTICULTURE.

Course I. Fruit and vegetable growing. Freshman II. Cady.

Lectures. Geography of fruit and vegetable growing, tilling, fertilizing and irrigation of lands; seed sowing and seed testing; fruits and vegetables under glass; pollination; diseases and injurious insects and their prevention; storing, harvesting and marketing varieties of fruits and vegetables.

Course II. Systematic pomology. Elective I. Green

Lectures. A general course in the study of cultivated fruits; their cultivation and classification.

Course III. Plant breeding. Elective II. Green

Lectures and laboratory work. The fact and philosophy of variation; crossing of plants and origination of domestic varieties.

Course IV. Nursery work. Elective II. Cady

Lectures and practice work. Seedage; layerage; cuttage; graftage; planting; pruning; thinning; storage of nursery stock; tillage of nursery lands; insects and diseases injurious to the nurseries and their prevention.

Course V. Greenhouse management and floriculture.
ElectiveII. Green and Cady

Lectures and laboratory work. Greenhouse construction and management; temperature; soil; watering; benches; propagation by seeds; cuttings; layers and grafting; prevention of diseases and extermination of insects in greenhouses; rest and growth periods of plants; plants for greenhouse cultivation.

Course VI. Landscape gardening. Elective I. Green

A general course in the practice and principles of landscape gardening; special attention being given to the planting of small grounds.

MATHEMATICS.

Course I. First part higher algebra. Freshman I. Snell

For those not having an entrance credit in this subject.

Course II. Solid geometry. Freshman I. Snell

For those not having an entrance credit.

Course III. Plane trigonometry. Freshman II. Snell

For those having credits in courses I. and II.

Functions of Plane Trigonometry, use of logarithm tables and numerous applications.

PSYCHOLOGY.

I. *Elements of Psychology.* I. or II.

This course is required for all advanced work in Psychology and for the teacher's certificate; it also serves as an introduction to the courses in Philosophy. The purpose of the course is to acquaint the student with the general characteristics and laws of mental life and with the aims and methods of Modern Psychology. The work consists of text books, lectures and essays. Open to sophomores, juniors and seniors.

II. *Educational Psychology.* I. or II.

The study of mental development in its relation to heredity and training. Lectures and student reports on the facts and theories of childhood and adolescence with special reference to their bearing on education. Open only to those who have completed course I.

RHETORIC.

I. *Rhetoric.* Freshman, I, II.

This course includes the study of formal Rhetoric, the writing of compositions, and the study and analysis of masterpieces of prose.

Students who have had special preparation in Debate may, by consent of the Head of the Department, substitute Argumentation for Rhetoric. This course aims at instruction in the science of argumentation and in the art of debate. The work consists of study of the laws and processes of reasoning, and their application to written and spoken argument. Speeches of eminent lawyers, made before courts in the trial of famous cases, are briefed and analyzed. Practical exercises in debate on the floor are a feature of the course.

II. *Rhetoric.* Sophomore, I, II.

A continuation of course I. Open also to sophomores of whom, at entrance, Rhetoric was not required. The making of plans and outlines and writing of compositions will form the greater part of the work. Some study of models of prose will be required.

VETERINARY MEDICINE AND SURGERY.

Course I. Anatomy.

Elective I. Reynolds. [First half semester, '07 and '08]

Comparative anatomy of the digestive organs, dissection, collateral reading and recitation.

Strangeway's Veterinary Anatomy is taken as text and guide and Chauveau is used for reference and comparison.

Course II. Body nutrition.
Elective I. Reynolds. [Last half semester, '07 and '08.]

This is an advanced study of the veterinary physiology of digestion, taking up the digestive fluids, nervous mechanism of digestion, absorption and digestion of grains and fodders. It also includes a study of body nutrition, body income and expenditures, sources of heat supply and heat loss, and metabolism. Veterinary Physiology, by F. Smith, is used as a text and guide for this work but students are required to do collateral reading.

Course III. Anatomy.
Elective II. Reynolds. [First half semester, '09 and '10.]

This course deals with the anatomy and mechanics of locomotion and conformation. The bones, articulations and muscles involved in locomotion and conformation are studied by text book, dissection and collateral reading. Shoeing, diagnosis and treatment of common forms of lameness may be included in course III. Strangeway's Veterinary Anatomy is used as a text book and Chauveau for reference.

Course IV. Diseases of domestic animals.
Elective II. Reynolds. [Last half semester '09 and '10]

Lecture and text book work on the diagnosis and treatment of common diseases; common medicines in their doses, uses, dangers and methods of administration.

Students

GRADUATE STUDENTS—2.

McDonald, William, Ph.D., Transvaal, Africa.
Fulkerson, Vincent, St. Anthony Park.

SENIORS—10.

Allen, Phillip T., Wolverton, Minn.
Blair, Donald Scripture, St. Anthony Park.
Cady, Le Roy, St. Anthony Park.
Gaumnitz, Carl, St. Cloud.
Heringa, Edward, Arnhem, Holland.
McDonald, May C., Minneapolis.
Mowry, H. H., Washington, D. C.
Pfaender, Maximillian, New Ulm.
Rose, John de Cew, St. Anthony Park.
Tomhave, William H., Fergus Falls.

JUNIORS—7.

Ainslee, George G., Rochester.
Foster, Jeannette Ora, St. Anthony Park.
Frear, Dana Walter, St. Anthony Park.
Mayland, Edwin, Rushford.
Moore, Walter M., Merriam Park.
White, Hall B., Winnebago.
White, William, Camden, N. J.

SOPHOMORES—14.

Bergstrom, Chester H.
Blackburn, James Raymond, Royal, Neb.
Carroll, Harry B., St. Paul.
Cooper, Thomas P., Minneapolis.
McNelly, Chester L., Caledonia.
Miller, Ralph C., Minneapolis, Sta. F., R. 1.
Orr, George Raymond, Michigan City, Ind.
Paterson, Thomas G., St. Cloud.
Peterson, Elvin Le Roy, Olivia.
Robinson, Mabel M., Minneapolis.
Russell, Hoy S., St. Anthony Park.
Titrud, Ole Lee, Cokato.
Underwood, Clarence, Hutchinson.
West, Ralph L., Minneapolis.

FRESHMEN—40.

Benson, Arnold Orlando, Glenwood.
Benzin, Bazil, Minneapolis.
Berry, James Bert, St. Paul.
Birdsall, Grace E., Minneapolis.
Chambers, Frank Ray, Havana.
Cleator, Fred William, Minneapolis.
Crandall, Le Roy V., Red Wing.
Crimmins, Ellen May, Minneapolis.
Daine, Henry Wells, Farmington.
Ells, Ruberta, St. Paul.
Gaumnitz, Florence, St. Cloud.
Gillis, James R., St. Paul.
Gore, John E., San Dimas, Cal.
Hartzell, Mary K., Minneapolis.
Hohle, Ola Arnold, Hector.
Jacobson, Norman, Port Washington, Wis.
Johnson, Frederick O., St. Anthony Park.
Krauch, Herman, St. Paul.
Laate, Gurid, St. Anthony Park.
Lathrop, Elbe Allen, Hugo.
Lewis, Charles L., Jr., St. Paul.
Lind, Emma S., Houston.
McCabe, Eva.
Marsden, Edith Viola, Edgerton, Wis.
Merrill, Alfred Stiles, Minneapolis.
Nelson, Marie Louise.
Peterson, Eric Ludwig, Dawson.
Pond, Harold H., Minneapolis.
Raymond, Charlotte A., Little Falls.
Robb, George Frederick, St. Paul.
Robinson, Alta E., St. Paul.
Rosholdt, Charles Eugene, Annandale.
Schrepel, Minnie Anna, Le Sueur.
Strunk, Blanche Alice, Faribault.
Svarstad, Anne, Bath, S. D.
Thompson, Arthur H., Minneapolis.
Underwood, William, Hutchinson.
Waller, Conrad Judson, St. Paul.
Ware, John F., St. Paul.
Wiegand, William G.

SPECIALS—2.

Garrett, Harry D., Osseo.
Valentine, Mrs. Wells. Minneapolis.

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PRESIDENT'S OFFICE

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